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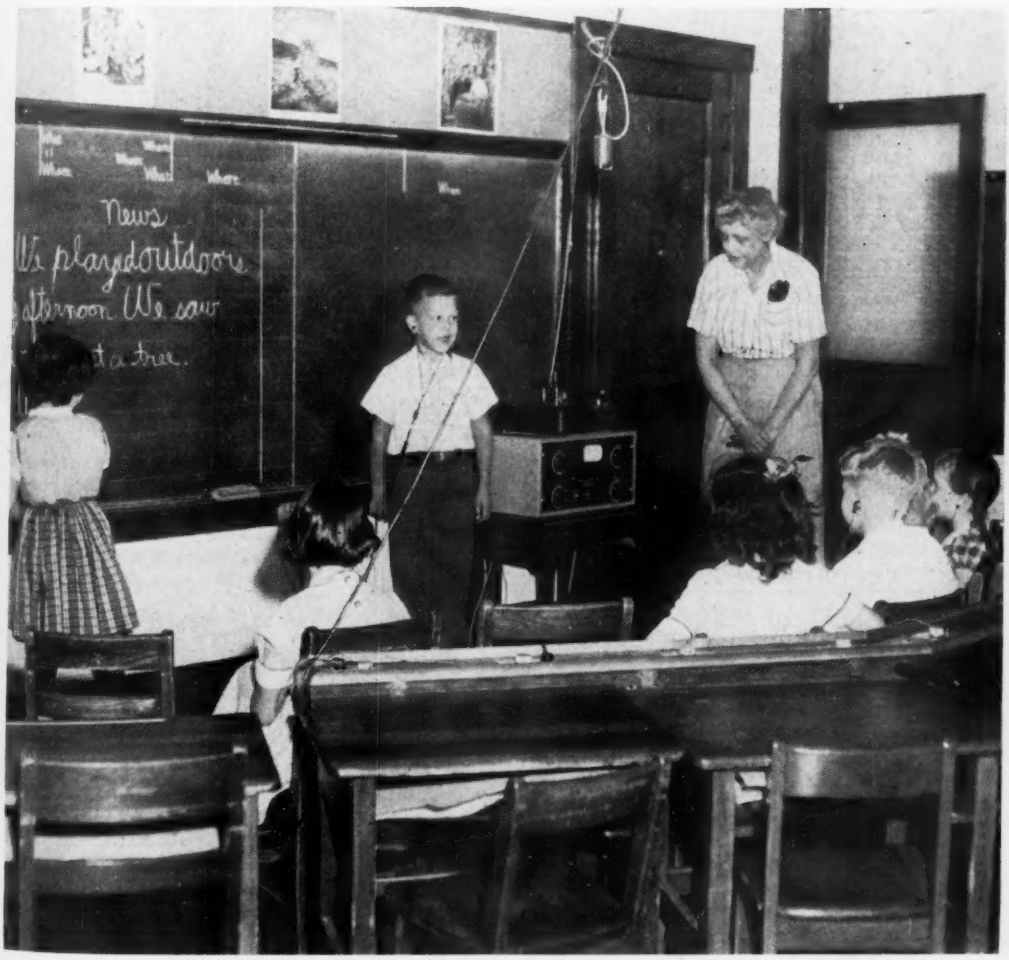

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COVER

The feature article this month, "Auditory Training: Its Possibilities and Limitations," was written by the Director of Research at The Clarke School for the Deaf. The cover picture illustrates the group hearing aid, with insert type of earphones, used with primary children at Clarke School.

THE ALEXANDER GRAHAM BELL ASSOCIATION FOR THE DEAF welcomes to its membership all who are interested in improving the education of the deaf and the hard of hearing, their ability to communicate with those who hear normally, and their adjustment to life in the hearing world. Its membership fee ($5 a year—$100 for life) includes a subscription to *The Volta Review*.

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Auditory Training: Its Possibilities and Limitations

A Keynote Address at the 63rd Summer Meeting Alexander Graham Bell Association for the Deaf, St. Louis, June 1954

C. V. Hudgins

TEACHERS of the deaf have long recognized the possibilities of auditory training for the hard of hearing and even for the severely hard of hearing pupil. These possibilities include: (A) The development of auditory speech perception; (B) better speech, which includes greater intelligibility, more natural voices, and rhythmic speech; (C) a broader and more flexible language development; and (D) as a result of these improved communication skills, the acceleration of the general educational program. The net effects of these benefits of auditory training have been that teachers, on the one hand, have found hearing aids a welcome tool making their tasks somewhat easier, and pupils on the other hand, have become better equipped to cope with the problems of the hearing world.

What are the limitations of auditory training? Physically, the limitations are fixed by the degree of deafness, on the one hand, and by the relative effectiveness of hearing aids on the other. A more severe limitation and one quite unrelated to the physical restrictions, however, is the general attitude of administrators and of teachers in terms of interest and willingness to acquaint themselves with the possibilities of auditory training and to exploit these possibilities to the maximum degree.

In recent years both the possibilities and limitations of auditory training have been affected by the enormous development in the science of electronics and engineering. Its possibilities have thus increased while its limitations have correspondingly diminished.

Historically the work of men like Itard and Toynbee in the early 1800's, and Urbantschitsch and Bezold in the late 1800's, demonstrated clearly the effectiveness of auditory training for deaf children. In America, Gillespie, in the Nebraska School for the Deaf, pioneered auditory training methods and demonstrated that approximately 15 per cent of the populations of residential schools could be taught by these methods. Goldstein, a pupil of Urbantschitsch, introduced the latter's methods in America in the late 1890's.[4] He later founded the Central Institute for the Deaf and became a staunch advocate of the "acoustic method." In the past most of the American schools for the deaf have had intervals of enthusiasm for auditory training, often occasioned by successes with individual pupils or classes. It is difficult, however, to find any evidence of a continuity of effort on the part of any particular school preceding the development of the first electronic hearing aid which appeared during the 1920's. The enthusiasm generated by spectacular successes usually subsided as the result of failures with other pupils. This factor, plus the sheer drudgery of administering an auditory training program without benefit of adequate amplifying devices, tended to dissipate the enthusiasm. For example, there is no evidence that the Nebraska School continued the pioneering efforts of Gillespie in spite of his obviously successful program on which he reported in 1884.[3]

The methods of instructions employed by the early workers involved direct acoustic stimulation to the ear. Bells, horns, tuning forks, musical instruments and other sound producing instruments, as well as speech sounds, were used directly in the ear. Hearing aids, as we know them today, were nonexistent. Results were measured in terms of auditory discrimination. They were concerned primarily with the number of words, or the number of sentences, or even the number of

Dr. Hudgins is director of research at the Clarke School for the Deaf, Northampton, Mass.

vowels the pupils were able to discriminate before and after training. There were also claims of improved auditory acuity as a result of auditory training. Much of the spectacular results claimed by these early workers, especially those results claimed for profoundly or "totally" deaf pupils, were probably obtained with pupils who would now be classified as hard of hearing and partially deaf. There is no real evidence that profoundly deaf children were ever taught to discriminate speech sound, especially since methods of auditory testing and testing equipment were crude and lacked standardization.

The advent of the modern audiometer provided more precise methods of measuring the degree of deafness and led to standardized methods in audiometry. Thus it became possible to classify pupils on the basis of the degree of hearing loss, with reference to a uniform scale. Audiometric testing programs have shown that 25 to 35 per cent of the population of residential schools can be classified as either hard of hearing, with hearing losses in the speech range from 50 to 65 db, or as partially deaf, with losses ranging from 65 to 80 db. These are the pupils who respond most readily to auditory training, many of whom achieve almost complete habilitation. The hard of hearing, with the help of modern hearing aids and auditory training, are usually able to complete their education in the public schools. The partially deaf offer a more difficult problem but respond to auditory training very well and usually achieve a high degree of auditory habilitation. It should be emphasized that auditory training is essential for both of these groups since without it, and without hearing aids, they must be taught as essentially deaf children.

The remaining 65 to 75 per cent of the pupils in our schools are classified as profoundly deaf, with hearing losses above 80 db. These pupils, for the most part, were formerly considered to be beyond the reach of hearing aids and were generally not included in the auditory training program. It is especially of this profoundly deaf group that I wish to speak at this time. Practically all of these pupils can be shown to have a remnant of hearing which lends itself to auditory training and which may be usefully employed in their education, provided that we have the proper group hearing aid equipment available. It is also essential that we have an understanding of the nature of the problem involved and that we bear in mind the possibilities and limitations of auditory training for this group.

It must be understood that the goal of our auditory training program for the profoundly deaf will be something less than that of establishing a hearing vocabulary or developing verbal discrimination by ear alone. Progress cannot be measured in terms of the number of words or sentences understood by purely auditory perception simply because they are, so far as we now can determine, incapable of acquiring verbal discrimination by ear alone. We can measure progress, however, in terms of the degree to which auditory perception supplements visual perception when both are employed simultaneously, and I should like to emphasize here that the possibilities in this direction are well worth your consideration. I shall present data to show that speech perception is improved when auditory and visual perception are combined for these profoundly deaf pupils, most of whom never reached the stage where verbal discrimination was possible by ear alone. I shall also demonstrate improvement in speech intelligibility and an acceleration in general educational achievement that accompany these improved communcation skills. These are real and significant gains in the field of deaf education. They mean that we are now able, thanks to the modern group hearing aid, to do more for our profoundly deaf pupils than was ever deemed possible.

Before presenting this evidence, however, I should like to make a few comments on the process of perception itself. It is a well-established theory in modern psychology that perception is a synthesis of multisensory information received by the organism from several sensory avenues at any given moment. In other words, the several sensory modalities are not highly compartmentalized in the process of perception. Rather, the senses of vision, audition, touch, and even taste and smell, may each contribute stimuli to the process. One modality may dominate the process and

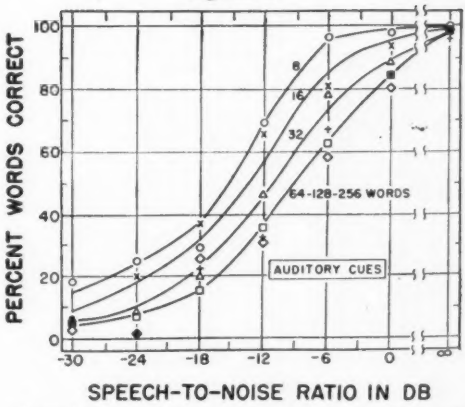
we may say "we hear it," "we see it" or "we feel it," but almost invariably other modalities contribute sensory information at the same time.

Teachers of the deaf have always emphasized this multisensory approach in teaching speech. They usually employ the visual and tactile senses, and whenever possible they employ the auditory sense simultaneously. I am convinced that it is possible to make use of this multisensory process in our auditory training program for profoundly deaf pupils. Our modern group hearing aids are especially adaptable to the employment of vision (lipreading) and audition simultaneously. We must remember, however, that vision will always dominate the perceptual process when dealing with profoundly deaf children, and that our teaching throughout the major portion of the school day must be carried on by means of both visual and auditory presentation. Thus, auditory cues will be constantly associated with the visual. The results appear in the form of a greater efficiency in speech perception than is possible by lipreading alone.

Thus, in evaluating the results of auditory training for profoundly deaf children, we employ a different criterion for achievement than that used for the hard of hearing, since we may not expect a high degree of discrimination by ear alone, but as stated above we can show that the ear may be trained to supplement the eye in the process of speech perception and that this bisensory approach is of real value in the educational program.

A recent study by Sumby and Pollack[5] strikingly illustrates how audition and vision work together in the speech perception of normal listeners under conditions of severe stress. The stress in this case was a relatively high noise level presented in the earphones of the listeners. The noise remained at a constant level while speech in the form of word lists was presented at different levels with respect to the noise. The speech material was presented under two conditions—by auditory presentation alone, and by auditory and visual presentation combined. The results of the study show clearly that even though none of the 129 subjects had had formal lipreading training, visual perception was an important factor under the severe noise conditions. These results are important to us because they illustrate the phenomenon of bisensory perception which obviously occurs in deaf children who have been submitted to an auditory training program. Figures 1, 2, and 3 are taken from the study of Sumby and Pollack. In Figure 1, the results of auditory presentation alone are shown. Speech perception (per cent words correct) is plotted as a function of the ratio of the speech to the noise. Speech levels range from 30 db below the noise to a level well above. The size of the different vocabularies need not concern us here. The scores for auditory perception alone range from practically zero to 100 per cent as the speech level rises above that of the noise. It is clear that auditory perception alone was definitely affected by the masking noise.

Figure 1

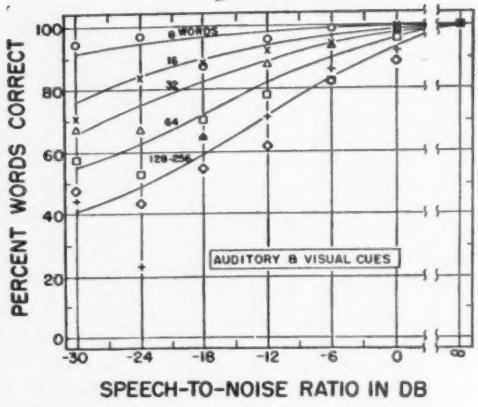


Speech perception of normal hearing listeners under conditions of auditory presentation alone as a function of the speech-to-noise ratio. (After Sumby and Pollack, 1954; reproduced by permission of the authors.)

In Figure 2 the results of auditory and visual perception combined are shown. Here we see how vision supplements the ear. Even under the most adverse conditions the listeners were able to understand a large percentage of the words. Figure 3 presents the two sets of data combined. Here the effectiveness of the bisensory presentation is clearly demonstrated.

Now I shall show that the same factor of bisensory perception is operative in hard of hearing and deaf children who

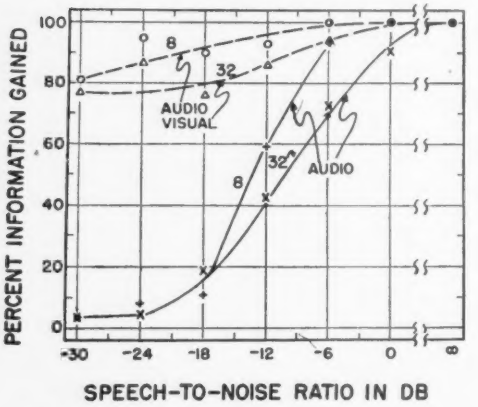
Figure 2



Speech perception of normal hearing listeners under conditions of simultaneous auditory and visual presentation as a function of the speech-to-noise ratio. (After Sumby and Pollack, 1954; reproduced by permission of the authors.)

have had auditory training. Figure 4 shows a plot of data similar to that of Sumby and Pollack, obtained from a hard of hearing boy. The per cent words correct is plotted as a function of speech level relative to the subject's auditory threshold. Word lists were read at levels of 10 db below threshold, at threshold, and 10, 20 and 30 db above threshold. The lists were read under the conditions of auditory

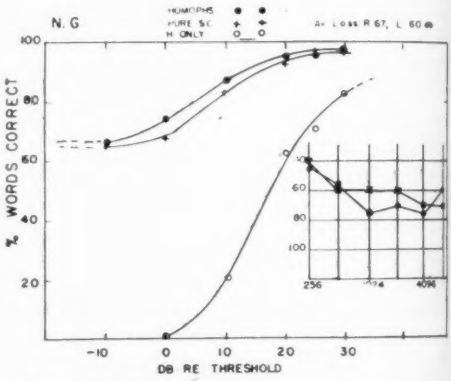
Figure 3



The information gained by normal hearing listeners as a function of speech-to-noise ratio when speech is received by auditory presentation alone and by auditory and visual presentation. The information gained is the number of words understood relative to the number presented. (After Sumby and Pollack; 1954, reproduced by permission of the authors.)

presentation alone, and auditory plus visual presentation. The curves are similar to those shown in Figures 1, 2 and 3. The segments of the upper curves at the left represent lipreading alone since the speech signals were at or below auditory threshold. The rise in the curve in the segment to the right shows the effect of audition plus vision as the speech level is increased above the auditory threshold. Speech perception by auditory presentation alone is shown by the lower curve. This curve is comparable to those in Figure 1. This subject has a hearing loss of 60 db and has developed almost a normal auditory speech perception ability.

Figure 4



Speech perception of a hard of hearing pupil as a function of speech level relative to the pupil's auditory threshold. The upper curves represent speech perception by auditory and visual presentation, the lower curve by auditory presentation alone. The left segments of the upper curves indicate pure lipreading while the rise of the curves to the right indicates the combined effects of lipreading and hearing. The pupil's audiogram is shown in the insert.

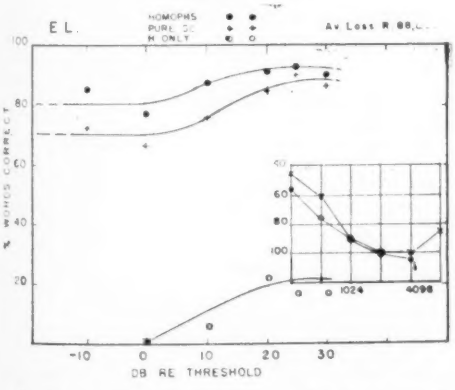
Figure 5 shows similar results although the hearing loss (83 db) is much more severe. The purely auditory perception score never rises above the 25 per cent level. We can see the effect of auditory perception, however, in the rise of the upper curve as the speech signals rise above the auditory threshold. Thus the bisensory scores are considerably higher than those for lipreading alone.

Both pupils described above have developed word discrimination ability as a result of auditory training and we may legitimately expect their speech perception

scores to be improved by the joint effects of vision and audition. But what about the profoundly deaf children who never develop auditory discrimination for words? Can we hope to improve their speech perception by means of auditory training even though verbal discrimination never develops? Figure 6 gives us an answer to these questions. The subject in this case has a hearing loss of 98 db in the speech range. The response by ear alone is zero at all levels of presentation. The rise in the curves as speech is presented at levels above threshold, however, shows that speech perception is considerably improved when hearing is added to lipreading. The two curves represent results of tests given at a two-year interval.

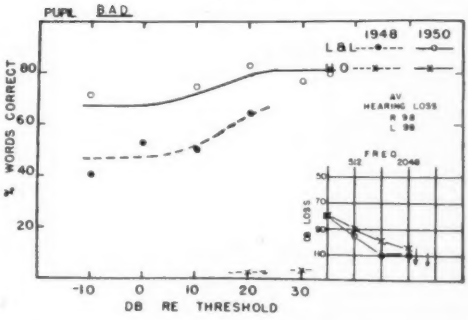
The above data represent individual cases. We need further information before we can draw a final conclusion concerning the effectiveness of auditory training for the profoundly deaf. Fortunately additional information on this question is available. During the past six years I have studied this problem rather thoroughly. The studies were sponsored and partly supported by the National Research Council's Committee on Deafness. An experimental group hearing aid that embodied all the essential features for bringing speech to profoundly deaf children in the most effective manner, was provided by the committee in the spring of 1948. The advantages of this experimental aid were so obvious that we began almost immediately to replace older hearing aids with new equipment that was comparable in all essential features to the experimental aid. By the end of 1951, 14 out of 20 classrooms were equipped with these modern group hearing aids. By the beginning of the school year 1953-54, the replacement program was completed. This equipment is available to all pupils throughout the school for the entire school day.

Figure 5



Speech perception of a partially deaf pupil. The coordinates are the same as those in Figure 4. The responses to hearing alone never reach a level above 25 per cent. The rise in the upper curves indicates that auditory cues add approximately fifteen percentage points to the lipreading score.

Figure 6



Speech perception of a profoundly deaf pupil. The coordinates are the same as those in Figure 4. This pupil is unable to discriminate words by ear alone, but the rise in the curves shows definite effects of hearing combined with lipreading. The two curves represent scores obtained at two-year intervals.

Several classes of pupils were selected for intensive study under this program. Special tests were devised and administered periodically for measuring progress in speech perception and speech intelligibility. General educational achievement was measured by the Stanford Achievement Test.

I have selected three groups of pupils from those tested under this program from whom scores will be presented. Group A consists of four severely hard of hearing and partially deaf pupils who have been studied for a period of six years beginning at the fourth grade level. Hearing losses for this group range from 55 to 86 db. Group B consists of eight profoundly deaf pupils, not all in the same class, who were studied for a period of six years beginning at the fourth grade level. Hearing losses for this group range from 90 to 98 db. Group C consists of five profoundly

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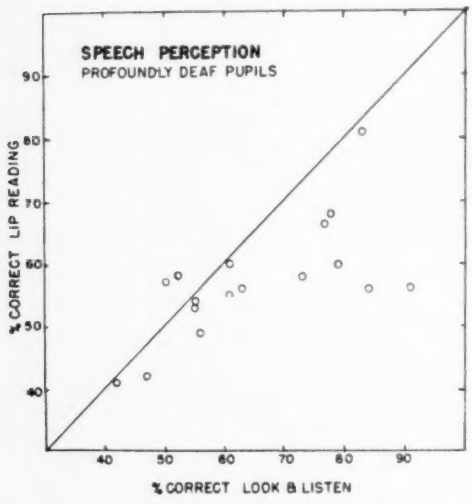
Figure 7



Speech perception of 17 profoundly deaf pupils. Lipreading scores are plotted against lipreading-hearing scores. Points falling to the right of the diagonal line indicate improved speech perception when auditory and visual presentation are combined.

deaf pupils, who have hearing losses ranging from 90 to 98 db, studied for a period of four years beginning at the third grade level. Group C represents a class which originally contained eight pupils, three of whom left school at the end of two years for various reasons. Pupils in all three groups had had auditory training throughout their entire school years. Modern group hearing aids were made available to them during the period of the study.

The progress of these groups has been summarized in the tables that follow. Three types of scores are presented: (A) Speech perception scores which include lipreading (LR), look and listen (LL), and hearing only (HO); (B) speech intelligibility as measured by the per cent of test words understood by a group of listeners; and (C) educational achievement as measured by standard educational achievement tests. The three types of scores will be discussed separately.

Speech Perception

A study of Tables of 1, 2 and 3 will show that all three groups of pupils gained in speech perception from year to year as measured by lipreading, and lipreading and hearing. It will be noted that only the pupils in Group A (Table 1) show any capacity for word discrimination by ear alone. The scores for hearing only (HO) for Groups B and C (Tables 2 and 3) remained at practically zero level throughout the period. The single exception is Pupil R (Table 2). This pupil became profoundly deaf at the age of seven years and responded to auditory training remarkably well. Previous experience in normal hearing and a normal language development were important factors in this case. However the low initial scores in all three tests, plus the steady rise in each category throughout the entire period, show that auditory training was absolutely essential in the rehabilitation of this pupil. He is

TABLE 1

Speech Perception—Lipreading; Look and Listen; Hearing Only
Group A—Partially Deaf Children

	Hearing loss db	*Tests*	1948	1949	1950	1951	1952	1953	1954	*Gain*	*I.Q.*
S.	55	LR	65	86	86	96	87	70	75	10	120
		LL	82	95	97	92	93	96	98	16	
		HO	63	84	85	82	84	80	86	23	
M.	70	LR	47	54	58	73	77	73	70	23	110
		LL	47	67	84	90	96	99	91	44	
		HO	27	17	40	48	35	71	71	44	
G.	78	LR	37	60	61	56	68	65	68	31	104
		LL	66	88	84	81	88	94	90	24	
		HO	15	47	55	46	40	73	67	52	
P.	86	LR	34	54	54	61	74	67	60	26	113
		LL	52	73	71	78	70	77	79	27	
		HO	4	22	19	6	20	26	35	31	

Average Gain: Lipreading (LR) 23—Look and Listen (LL) 28—Hearing Only (HO) 37

TABLE 2

Speech Perception—Lipreading; Look and Listen; Hearing Only
Group B—Profoundly Deaf Pupils

	Hearing loss db	*Tests*	1948	1949	1950	1951	1952	1953	1954	*Gain*	*I.Q.*
K.	90	LR	33	44	52	51	51	59	54	21	116
		LL	32	50	57	54	54	58	55	23	
		HO	0	0	2	0	0	0	0	0	
B.	95	LR	33	53	59	56	65	66	58	25	87
		LL	53	68	70	74	63	69	73	20	
		HO	4	12	7	4	0	4	7	3	
R.	93	LR	26	51	42	63	66	56	....	30	117
		LL	60	85	83	87	81	91	....	31	
		HO	15	48	58	64	12	64	....	49	
T.	98	LR	26	42	44	52	51	70	57	31	96
		LL	23	55	52	55	63	58	50	27	
		HO	0	0	0	0	0	0	0	0	
W.	93	LR	46	72	55	63	69	80	81	35	128
		LL	56	64	64	85	85	94	83	27	
		HO	0	4	0	4	6	27	13	13	
C.	93	LR	28	34	43	36	44	52	41	13	119
		LL	22	40	44	46	40	43	42	20	
		HO	0	0	0	0	0	0	0	0	
L.	91	LR	24	30	44	52	53	59	59	35	108
		LL	24	38	49	53	64	64	60	36	
		HO	0	0	1	0	0	1	0	0	
H.	91	LR	21	35	35	45	55	58	55	34	101
		LL	21	29	42	51	66	57	61	40	
		HO	3	2	3	8	10	14	9	6	

Average Gain: Lipreading (LR) 28—Look and Listen (LL) 28—Hearing Only (HO) 0

TABLE 3

Speech Perception—Lipreading; Look and Listen; Hearing Only
Group C—Profoundly Deaf Pupils

	Hearing Loss db	*Tests*	1950	1951	1952	1953	1954	*Gain*	*I.Q.*
B.	90	LR	33	38	55	65	68	35	113
		LL	44	51	65	75	78	34	
		HO	3	5	6	5	6	3	
S.	98	LR	16	33	41	56	56	40	127
		LL	24	37	51	63	63	39	
		HO	0	0	0	0	0		
P.	90	LR	20	24	41	42	....	22	....
		LL	20	27	40	47	....	27	
		HO	0	1	....	15	....	14	
K.	98	LR	13	27	42	45	49	36	120
		LL	19	32	44	47	56	37	
		HO	0	0	0	0	0		
R.	95	LR	22	46	59	69	67	45	129
		LL	48	49	71	72	77	29	
		HO	6	11	16	17	7	1	

Average Gain: Lipreading (LR) 35—Look and Listen (LL) 33—Hearing Only (HO) 3

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now in junior high school and gets along very well with an individual hearing aid.

The significant feature in the speech perception scores is that almost invariably the look and listen scores are higher than those for lipreading alone. We should naturally expect higher scores from Group A when visual and auditory presentation are combined, since their scores for auditory presentation alone show high auditory discrimination. Pupils in Groups B and C, however, never achieve a useful level of auditory discrimination, yet we can see that the auditory cues, when combined with lipreading, add considerably to the total speech perception score. Figure 7 shows this effect graphically. Speech perception scores obtained by lipreading alone are plotted as a function of look and listen scores. We should expect that all scores would fall on the diagonal line if audition played no part in the perception process. The scatter of points below the diagonal line indicates the effects of hearing on lipreading, and the distance of the points below the line is a measure of these effects.

Speech Intelligibility

The speech intelligibility for the three groups are shown in Tables 4, 5 and 6. Consistent though small gains were made by the pupils from year to year. The testing program here reported began at the third and fourth grade levels. At this stage in their educational development, the speech habits of our pupils are well established. We might, therefore, expect to find further improvement in speech occurring at a relatively slow rate. There is abundant evidence, both in our own experience and in that of others, to indicate that auditory training is most effective in speech development during the early years. Two important studies recently published in Sweden by Wedenberg,[6,7] and another from London by Frey and Whetnall,[2] support these conclusions. The Ewings of Manchester, in their latest book,[1] also recommend starting auditory training at the earliest possible age.

Educational Achievement

The general educational program should be facilitated by improved communication

TABLE 4

Speech Intelligibility
Group A—Partially Deaf Children

	Hearing Loss db	1948	1949	1950	1951	1952	1953	1954	*Gain*	*I.Q.*
S.	55	78	76	82	82	88	92	86	8	120
M.	70	48	72	84	76	86	88	94	46	110
G.	78	66	58	76	...	82	77	78	12	104
P.	86	38	42	32	44	52	53	55	17	113

Average Gain: 21

TABLE 5

Speech Intelligibility
Group B—Profoundly Deaf Pupils

	Hearing Loss db	1948	1949	1950	1951	1952	1953	1954	*Gain*	*I.Q.*
K.	90	36	32	34	35	34	44	35	0	116
B.	95	43	58	58	74	70	61	61	18	87
R.	93	74	76	78	87	92	94	...	20	117
C.	93	16	28	22	24	38	41	42	26	119
W.	93	34	46	44	56	52	64	63	30	128
L.	91	26	42	38	54	52	54	63	37	108
T.	98	20	36	36	30	36	44	46	26	96
H.	91	30	44	46	62	54	63	61	31	101

Average Gain: 24

TABLE 6

Speech Intelligibility
Group C—Profoundly Deaf Pupils

	Hearing Loss db	1950	1951	1952	1953	1954	*Gain*	*I.Q.*
B.	90	36	31	46	54	48	12	113
S.	98	40	31	50	42	48	8	127
P.	90	42	36	36	44	....	2	.....
K.	98	22	21	46	34	45	23	120
R.	95	42	56	60	50	64	22	129

Average Gain: 13

skills. The evidence presented above shows that these skills, speech perception and speech intelligibility, are improved by auditory training. The educational progress of the deaf child is relatively slow, especially during the early years, because of the speech and language handicap. Therefore factors which facilitate the development of communication skills should at the same time affect the general educational progress.

The groups described above were tested each year for educational achievement and their progress noted. Tables 7, 8 and 9 show this progress in terms of grade equivalent per year. Occasionally an individual may gain an average of one grade per year but the group as a whole gain less than one full grade per year. The average yearly gains for the three groups studied was .85, .84, and .84 grades per year; this means that pupils in these three groups were advancing at the average rate of about four grades in five years. You may naturally ask how the progress of these groups compares with that of pupils who were in school before the present auditory training program was inaugurated. Comparative data are available for 18 classes—125 children—who were in school during the years between 1933 to 1945. Hearing aids were available to only a few of these classes during the earlier years of this period. Group aids were available to all classes after 1939. Scores for each class are available from four to seven years during the period of 1933 to 1945 (see Table 10). The average yearly gain in grade equivalent for the 18 classes was .63 grades per year. This is an average rate of three grades in five years. Only three of the 18 classes made average gains comparable to the three groups described in this paper.

These figures suggest rather strongly that auditory training can be an important factor in accelerating the total educational program, not only for the partially deaf but for the profoundly deaf as well. This is an intriguing possibility. If it should become possible to graduate pupils on the average of one year earlier than at present, it would mean a savings in educational costs of approximately 10 per cent. Aside from the economic considerations, however, auditory training pays off in terms of an enrichment in the quality of the educational program that we are able to provide for deaf children. Pupils leave our schools with better speech, with a greater competency in speech perception, and with

TABLE 7

Educational Achievement—Grade Equivalent
Group A—Partially Deaf Pupils

PUPIL	1948	1949	1950	1951	1952	1953	GAIN
S.	4.0	5.1	6.4	7.6	8.1	9.4	5.4
M.	3.5	4.3	4.8	5.8	6.8	7.3	3.8
G.	3.9	4.7	5.6	6.4	6.6	6.0	2.1
P.	4.3	5.0	6.4	7.2	7.8	9.6	5.3
Total Average	4.0	4.8	5.8	6.7	7.3	8.0	4.2

Average Yearly Grade Equivalent Gain: .84

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TABLE 8

Educational Achievement Test—Grade Equivalent
Group B—Profoundly Deaf Pupils

PUPIL	1948	1949	1950	1951	1952	1953	GAIN
K.	4.4	5.2	6.8	7.6	8.1	9.5	5.1
B.	3.6	4.2	4.6	5.0	5.4	6.2	2.6
R.	4.8	7.4	9.0	9.5	10.9	...	6.7
T.	3.0	4.0	4.8	5.1	5.9	6.2	3.2
W.	3.4	4.2	5.1	5.9	6.8	9.0	5.6
C.	3.6	4.5	4.9	5.2	6.2	6.7	3.1
L.	2.2	3.4	4.4	5.2	5.8	6.6	4.4
H.	3.1	3.5	4.3	4.8	5.1	5.5	2.4
Total Average	3.6	4.6	5.4	6.0	6.7	7.1	4.2

Average Yearly Grade Equivalent Gain: .84

TABLE 9

Educational Achievement—Grade Equivalent
Group C—Profoundly Deaf Pupils

PUPIL	1950	1951	1952	1953	1954	GAIN
B.	2.8	3.3	4.4	5.5	6.6	3.8
S.	2.6	3.3	4.6	5.6	7.0	4.4
K.	3.3	3.0	3.6	4.6	5.5	2.2
P.	2.8	3.0	3.4	3.9	...	...
R.	2.5	3.2	4.1	4.6	5.9	3.4

Average Yearly Grade Equivalent Gain: .85

TABLE 10

Educational Progress in Terms of Average Grade Equivalent Per Year of Former Classes at Clarke School During the Years of 1933 to 1945

CLASS	Number of Pupils	Period	No. Years	Average gain in grade equivalent per year
1	7	1933-37	4	.65
2	5	1933-37	4	.50
3	5	1934-38	4	.85
4	8	1938-45	6	.47
5	8	1941-45	4	.40
6	7	1940-45	5	.5
7	11	1937-43	6	.43
8	7	1937-43	6	.49
9	6	1938-43	5	.72
10	5	1935-42	7	.90
11	5	1936-40	4	.60
12	5	1934-40	6	.63
13	6	1934-40	6	.60
14	10	1933-37	4	.55
15	7	1936-42	6	.74
16	8	1936-41	4	.67
17	7	1933-39	6	.85
18	8	1934-38	4	.60

Average Yearly Gain for All Pupils Was .63 Grades

a greater flexibility in language as a result of auditory training. These skills they take with them as they enter high schools or trade schools to complete their education in competition with hearing students. They are able to rely upon these newly-established auditory skills because of their previous auditory training and because they are able to wear individual hearing aids which permit them to continue to utilize their residual hearing in all manner of social intercourse.

In summary, I should say that auditory training has had a sporadic history. Its advocates have often spoken boldly and have demonstrated its possibilities especially with partially deaf children. But its complete fruition has awaited the development of the modern, electronic, group hearing aid. Early claims of successes were based upon results obtained from children whose hearing losses were inadequately measured, but probably should be classified as partially deaf. Profoundly deaf children were considered as "totally" deaf and therefore beyond the reach of acoustic stimulation. Results of auditory training were invariably measured in terms of auditory discrimination of vowels, words and sentences. Failure on the part of the child to acquire auditory discrimination was an indication of total deafness. Modern group hearing aids are capable of transmitting high fidelity speech signals up to the maximum level of auditory stimulation. Modern audiometers show that practically all deaf children have a fragment of residual hearing. Experience has shown that this fragment, however small, may be trained to supplement vision in visual-auditory presentation. The result is that while auditory discrimination for the profoundly deaf seems impossible, the auditory stimulus, as a supplement to vision, may become active in speech perception following auditory training. Achievement in auditory training, therefore, formerly measured in terms of auditory discrimination, may be successfully measured in terms of the difference between scores obtained by visual presentation (lipreading), and visual plus auditory presentation. Evidence has been presented to show that the bisensory method of presentation is superior to the purely visual in three groups of pupils, two of whom were profoundly deaf. Following a regimen of auditory training these pupils showed improved speech perception and improved speech intelligibility, and there is a suggestion of a positive acceleration in general educational progress. These benefits go with the pupils as they graduate since they are capable of wearing individual hearing aids.

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NEW MAGAZINE ON NOISE CONTROL

Beginning in January 1955 the Acoustical Society of America will sponsor a new bimonthly publication entitled *Noise Control.* According to a recent announcement, editorial coverage of the magazine will include all phases of noise control. Deafness and the testing of hearing, and the physiological and medical aspects of noise, including protection of hearing, are among the numerous subjects specifically mentioned for coverage. Lewis S. Goodfriend will serve as editor of the publication which will sell for $8.00 per year ($5.00 to the members of the Acoustical Society). Inquires should be addressed to 57 E. 55th St., New York 22, N. Y.

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Auditory Training

A Summer Meeting Panel Discussion, June 16, 1954

MODERATOR: LEO G. DOERFLER, PH.D.

Director, Department of Audiology, Eye and Ear Hospital, Pittsburgh, Pennsylvania

DR. DOERFLER: Our panel this afternoon consists of a group of people with a wide variety of interests in the field of auditory training. They range from that rare person on a convention program, someone who actually teaches, to individuals who supervise teachers, teachers of teachers, and workers in the institutions which do research on how we should give auditory training. I wrote to these individuals—six in all—asking them to speak for a period of approximately eight minutes and to cover, if possible, the following questions: (1) What do you understand to be the meaning of benefit from a hearing aid? (2) How much time in an educational program for deaf children should be devoted to auditory training and what type of auditory training should be used? Following these reports Dr. Clarence V. Hudgins, who delivered this morning's keynote address on the possibilities and limitations of auditory training, will join the panel to answer questions from the floor.

Auditory Training—A Panel Discussion

The Preschool Child

RUTH E. BENDER

Supervisor, Preschool Hearing Program, Cleveland (Ohio) Hearing and Speech Center
Instructor, Western Reserve University, Cleveland

MY segment of this discussion will be slanted toward the very young preschool child with impaired hearing, because that is my particular interest in this field. The chairman has asked for an expression of opinion on two questions:

1. What do you understand to be the meaning of benefit from a hearing aid? For the two- and three-year-olds we mean awareness of sound, naturalness of approach to oral language situations, and better voice quality. We do not demand hearing for speech discrimination before we consider it a benefit.

2. How much time should be devoted to auditory training and what type of auditory training should be used?

If by auditory training is meant the wearing of a hearing aid for contact with the environment, then our goal is, as nearly as is practical, the child's every waking minute. If one means specific speech and language contacts emphasized through auditory patterns, the time involved would vary with the child's age level and the class structure, but should certainly occupy as much of the teaching procedure as is practical, simultaneously with every other avenue of approach to language.

Our experience in the use of hearing aids with very young children has evolved for us four principles in which we firmly believe. These I should like to present, with one child to illustrate each. I am fully aware of the fact that one swallow does not make a summer, but this is only by way of illustration until we are ready to organize significant statistics.

First, we believe in beginning a child's auditory training at the earliest possible moment. One baby entered our nursery at the age of eleven months. As nearly as we can judge by sound pressure level correlation of her volume setting of the desk amplifier for comfort level, she will show a hearing loss of around 35 decibels. She was, when we began her auditory training, at the beginning of the stage where voice quality and personality response first show the effects of hearing loss. We gave her a

small, light, low-gain instrument. Now, after about two months of wearing, her babbling is as musical and flexible as a child's can be. Last week, as I carried her into the nursery, her mother called after her, "Bye-bye." Over my shoulder, the baby waved and answered, "Dye-dye."

Second, we believe in using amplification for a child as much of the time as possible. One small boy came to us as a severely deaf child, by all the tests then at our disposal. By the age of 16 months he was wearing a hearing aid, and has worn it consistently for a year and a half. His speech reception threshold at present hovers around 50 decibels. It will probably be less than that eventually. From his use of speech, we will expect him to show a high tone drop off. This boy was riding his tricycle, with a trailer attached, around the nursery the other day and shouting over his shoulder, "No, no," at another child who was trying to detach the trailer. He saw a young child climbing the stairs and called to me anxiously, "Baby well wown." When he is lipreading at the same time, he can say, "Baby fell down." This child is not yet three.

Third, we believe that every child with impaired hearing has a right to what help he can derive from amplification. It is not ours to decide if his loss is too deep to bother with a hearing aid, until he has had a chance. One of our little fellows, according to his own setting of the volume of the desk amplifier, shows a 70 to 80 db hearing loss. He responded to a hearing aid only when we fitted him with as much gain as possible. But he looked up at me while listening to a record recently and repeated familiar words from the song—"car," "bye-bye." This child is three.

Fourth, we believe that every little child who needs amplification, also needs specific and intensified help for the early part of his language learning. We had one little lad who had a 35 db speech reception threshold, correlated with a psychogalvonometer skin resistance test. It seemed logical to remove this child from specific training, and expect him to absorb language naturally by means of his hearing aid. It did not work out that way. At the end of a school year, he had less language than he had at the beginning. Children with much less hearing than he, who had continued their specialized training, had more speech and language than this confused little boy. So he came back to a group of hard of hearing children. Another year's work with him has given us a well-organized little five-year-old, who runs out to call another child, "Peter, your mother wants you."

Not one of these children is an isolated case. They show the direction in which our auditory training for little children is moving. It is not armchair philosophy. The children have led the way.

Auditory Training—A Panel Discussion

Research Trends and Practical Applications

LOUIS M. DICARLO, ED.D.

Executive Director, Gordon D. Hoople Hearing and Speech Center, Syracuse University, Syracuse, N. Y.

IT is indeed a privilege to have this opportunity to be a member of this panel. The chairman has asked us to consider two vital and timely questions: "What do you understand to be the meaning of the benefit of a hearing aid and how much time should be devoted to auditory training?" and, "What kind of auditory training should be included in an educational program for hard of hearing and deaf children?"

The first question cannot have an "either-or" answer, since we must consider the kind of hearing aids, group and individual, and also what individuals employ the hearing aids, whether adults, or children with spontaneous language development, or children without language at the different levels, or babies diagnosed as having sufficient loss to warrant the use of a hearing aid.

Today, one hears marked conflicting opinions concerning the efficacy of hearing

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aids. Some advocate putting hearing aids on babies. The opinions are projected with such vehemence that they obscure the middle area of the continuum between the two extremes. The time has come to face issues.

A Study of Deafened Veterans

A cursory examination of literature reveals that DiCarlo,[1] under the leadership of Dr. Grant Fairbanks, attempted to measure the benefits of hearing aids and auditory training with the returning veteran deafened casualties. The experiment had certain limitations and even though no standardized test was available, he worked out a test which resembles a good deal the PB list later made available by the Psycho-Acoustic Laboratory of Harvard University. In this experiment live-voice was used but there was a definite attempt to control as many of the variables as possible. Of 472 veterans, first tested without a hearing aid, and then tested again as soon as they received an aid, a statistically significant gain in performance was observed. The same was true of a control group of 53 individuals. In fact, the scores without a hearing aid for the 472 and the 53 veterans, were similar, as were also the scores when they first received their instruments. The wearing of a hearing aid revealed significant benefit as compared to performance without the aid.

The experimental group of 472 veterans were tested after four weeks of auditory training. The gain was once more statistically significant. The gains for the control group, after wearing the instrument for four weeks or more, revealed no significant difference, so that auditory training for the experimental group was quite instrumental in better hearing scores —but, let's face the issue. These veterans were all men who had developed language and speech. An attempt to use this as an analogy for performance of hard of hearing and deaf children who have not developed language, is not only fallacious but quite insidious.

Other Experiments and Research

Gates and Kushner[2] attempted to analyze some of the variables in learning to use hearing aids. They discovered that many children did not wear hearing aids even though they had them, and that those children who did wear the aids had greater hearing losses so that the need for hearing was certainly a significant variable. The study did reveal quite clearly that many variables are involved in the wearing of a hearing aid.

Weaver[5] evaluated hearing aids worn by school children. He used children from fourth to tenth grades, and divided the groups into children who wore them less than eight hours, and children who wore them more than eight hours. He found that the amount of gain and speech reception was not related to the amount of time the aid was worn. He also found little connection between hearing loss aided and unaided and the amount of time the aid was worn. His investigation also disclosed that the amount of residual hearing had little relationship to the length of time the aid was worn, and also found that many school children did not wear their aids.

Hopkins[3] studied the relationship between the degree of deafness and the response to acoustic training. Her findings indicate that the relationship is a variable one and not predictable, but even profoundly deaf children may profit from the use of a hearing aid. She felt that the different scores between lipreading and "look and listen" might be considered a measure of auditory training improvement.

Wedenberg[6] investigated auditory training for deaf and hard of hearing children. He found a number of interesting phenemona. He felt that young children benefit more than older children with respect to intelligibility. He postulated that auditory cues are more meaningful in earlier stages before they develop poor speaking habits. He also indicated that all children profited by auditory training. In some cases the hearing acuity increased while in other cases the hearing acuity decreased as measured by the audiometer.

Hudgins[4] has conducted the most extensive and objective research program dealing with these questions, in America. He has demonstrated unequivocally that speech perception and the educational progress of profoundly deaf children are improved by auditory training, when specially constructed high fidelity hearing

aids are utilized. He has also demonstrated that speech intelligibility may be most effectively influenced by auditory training below the primary grades and has faced the issue that a hearing aid is a teaching aid, not a substitute for hearing.

During the years of 1938-1947, we educated a number of severely hearing impaired children in the New Rochelle Public School System as part of the school population. Of twelve children with severe hearing impairment, eight learned to speak spontaneously while four learned language and speech by special means. An examination of the hearing losses of these children revealed that the eight children, who learned to speak spontaneously, had losses of 60 db or less while the four who did not learn to speak spontaneously had losses of 80 db or more.

Evaluation of the research quoted indicates certain trends showing that hearing aids may be beneficial, even to profoundly deaf children, but that they are more beneficial to children with losses of 60 db or less. Hearing aids would also help others up to 80 db loss, depending upon the time when the hearing aid is provided for the child and also the type and amount of auditory training provided. Moreover, 85 db appears to be a crucial threshold level. Children with losses of 80 db or greater appear to derive limited benefits from a hearing aid, and up to the present time lipreading has remained for them an important avenue of understanding communication.

The Issues

We must face the following issues:

1. A hearing aid is not a substitute for hearing.

2. Some children with losses of 60 db and less may profit by a hearing aid and an adequate program of auditory training, and may even learn speech and language spontaneously.

3. Children with losses of 80 db or more can expect only minimum benefit from the use of a hearing aid.

The question concerning auditory training is as vital and important as the hearing aid itself, since the successful use of a hearing aid for children with serious hearing losses is contingent upon an adequate program of auditory training. Such a program must provide for a systematic presentation of acoustic stimuli for the development and refinement of the interpretive process. The program must be a continuous one structured within the framework of adequate learning theory and must function on the basis of child development principles. Merely speaking into a microphone does not, in my mind, represent auditory training. A program of auditory training must emphasize the interpretation of auditory stimuli with reference to daily life experiences. The child's exposure to sound must be pleasant and should provide for development of sound-consciousness, sound-curiosity, and pleasure in listening. In the first stages the child listens to sound as natural phenomena. In the next stages the acoustic stimuli become intermediary and referential in character. Here the child learns to attribute meaningful values to auditory symbols. The refinement of his listening process continues as he learns to discriminate between similar speech, sounds, recognized accent and rhythm patterns, inflection, and reacts to multiple complex variables to understanding speech. This means the development of adequate vocabulary and the functional use of vocabulary into language units. When the child has reached this stage, auditory training has helped him to understand speech and other sounds as communication and adjustment stimuli. This development of communication must be the primary objective of an adequate program of auditory training.

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Auditory Training—A Panel Discussion

Divergent Points of View and a Position for Educators

LLOYD A. HARRISON

Superintendent, Missouri School for the Deaf, Fulton

THE discussion this afternoon centers around a phase of work with the deaf and hard of hearing, properly called auditory training. By auditory training we mean training the individual to put to use what hearing he possesses, even though it may amount to no more than an ability to discriminate between a few grossly amplified sound patterns. Certainly with the advent of electronic amplification equipment it is often possible to utilize to some degree any element of hearing possessed. The improvement in quality of both individual wearable hearing aids and group amplification equipment has been extensive. Just what the potential value from the use of this equipment is going to be in the education of the deaf and hard of hearing is yet to be accurately determined. Certainly enough evidence of the educational value of using this equipment is now available that no conscientious educator of the deaf and hard of hearing can ignore the actual and potential good that has and may result from its use.

There are widely divergent points of view, ranging all the way from a reactionary negative attitude, which discounts the use of all such equipment as mere fadism and gadgetry, to that of certain overzealous advocates who are reluctant to admit that there are those whose auditory impairment is so total as to preclude the use of amplification remedially. Some are inclined to indicate that amplification equipment, if used skillfully and early, will make it possible for the educator of the deaf child to blast his way through sonic blocks and bombard and charge the so-called memory banks, thus making hearing individuals out of even the most profoundly deaf.

Somewhere between these two extreme points of view seems to be the sensible position for educators of the auditorily handicapped. A good auditory training program should be based on a sound and sensible approach. Fundamental to this approach is an adequate and thorough testing program designed to tell us early which children show promise of appreciably benefiting from auditory training.

The program, above all, should have continuity. It should be started as early as possible and continued throughout the school life of those individuals who possess enough auditory acuity to make it possible for them to benefit. Auditory training may possibly be beneficial to those individuals whose residual hearing is very slight. The end benefit of auditory training in some individual cases may be only scanty auditory clues which allow the individual to speak and to speechread a little better than would otherwise have resulted without such training. The benefit may even be so slight as to amount to nothing more than a motivational device to encourage the child with a serious impairment to vocalize more willingly and possibly to assign meaning to the few sounds he hears. Prognosis in the case of borderline individuals is extremely difficult. On the other hand, in the case of even severely hard of hearing children with properly fitted aids, the benefit derived from such training may well render them able to hear and understand spoken connected language normally and to speak quite intelligibly. Often these children are capable of receiving sound patterns in a near normal manner, provided they are amplified. The results to be expected, therefore, range all the way from very minor benefits, in the case of children with serious auditory disorders, to practically normal functional hearing and speech in the case of certain hard of hearing children.

It is difficult and risky to generalize. Each individual case is different and the degree of success of any training program

(*See "Auditory Training," page* 368)

Hearing Aids for Deaf Children?

WILLIAM G. HARDY, PH.D.

WHEN a child has so much impairment of vision that he must be trained in a sight-saving class, it is usually taken for granted that he wears glasses. As a matter of fact, he has usually worn glasses for some time, long before he enters school. It is doubtful, indeed, that any teacher or school superintendent would say to this child's parents: "He does not get much help from his glasses, and really does not need them. Suppose we take them off and train him as a totally blind child."

Yet, a situation much like this occurs commonly in the management of the deaf child, and the comment is made daily: "He has so little hearing that it is a waste of time and money to bother with a hearing aid. Suppose we forget about the hearing aid—we don't think it helps him—and concentrate on training him as a totally deaf child." What goes on here?

Powerful New Tools Are Helpful

With the advent of the vacuum-tube amplifier and hearing aid and, more recently, the transistor aid, powerful new tools have been developed that prove to be of great benefit in the training of the deaf child. That these tools are not being used to the fullest extent is a matter for great concern. With the use of modern diagnostic methods and measurements, there need be no mystery about the amount and kind of hearing impairment even in very young children, and a reasonably good prediction can be made about the child's use of his residual hearing. A hearing aid makes sounds louder, and, depending upon the amount of hearing potential a child has, can bring him some—or a great deal—of the world of sound. This is a matter of medical-technologic-behavioral fact, and is not dependent upon any particular educator's allegiance to any particular educational methodology.

Dr. Hardy is director of the Hearing and Speech Center, The Johns Hopkins Medical Institutions, Baltimore, Maryland.

The question — hearing aids for children?—is pointed up in a comment made recently on the editorial page of a school publication concerning a meeting of a group of educators of the deaf:

> Much consideration was given to the matter of hearing aids, their use and abuse. Educators of the deaf are glad to welcome improvements that are being made to hearing aid instruments, but deplore the fact that in many instances such aids are sold to individuals, who, because of their degree of hearing loss, cannot benefit by their use. Furthermore, the idea of placing hearing aids on children merely because they can understand the spoken words more readily with the use of such instrument, is not the solution to the educational problem.

If this statement means what it seems to mean, there is ample reason to examine carefully the thinking it seems to reflect.

First, it is difficult to conceive of an abuse of a hearing aid, short of slamming the thing on the floor, tearing the receiver cord in two, puncturing the microphone, or similar acts of vandalism. A hearing aid is an electronic instrument designed to make sounds louder; it can do nothing else. It cannot think; it cannot perceive; it cannot react in any way. It has neither mind nor soul. The only abuse to which it can be subjected is that which human beings inflict upon it. One assumes, of course, that a hearing aid would not be worn during periods of rough play.

Second, in the nature of things there are only a relatively few children with total hearing loss, or with the physiologic potential of hearing so debased that the most powerful hearing aids cannot penetrate. On the other hand, there are many children with serious bilateral hearing impairment who have never been exposed to amplified sound, whose minds have never learned to comprehend sound, and who act as though sound is completely meaningless to them —as, indeed, it may well be. To state that they are totally deaf, however, because

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they do not act as though they hear, is to argue in a circle. They act totally deaf because they have not had any opportunity to know sound.

With due respect to psychoacoustic fact, it makes little difference whether a child has a 65-decibel hearing impairment or an 85-decibel hearing impairment (the one is ten times greater than the other); either would be deaf, in the sense of the mind's ability to comprehend average conversation, without the use of amplification and special training in language. Yet, the child with the 65-decibel hearing loss can, other things being equal, learn to live and get along within the range of ordinary conversation. The child with the 85-decibel impairment can never clearly perceive ordinary conversation and must depend basically on vision; but even he can gain a great deal of benefit from the consistent, persistent use of (exposure to) amplified sound.

A Few Cannot Be Helped

Without doubt there are a few children whose hearing potential is so debased that they cannot profitably use amplification. But this is a small group, percentagewise; statistically, their number is insignificant in matters of educational philosophy and policy. That a few families with children in this group are led to buy hearing aids is regrettable. One must assume that the sellers of the aids are proceeding with conviction and the hope that some small stirring of audition will be of help. This is the only assumption that is reasonable, for the total aggregate of hearing aid sales to deaf children of all degrees amounts to only a small proportion of the annual output of hearing aids.

The Object of Hearing Aid Use

Third, "the idea of placing hearing aids on children merely because they can understand the spoken words more readily" is the whole object of the use of hearing aids for deaf children. Were children to understand spoken words readily, they would not be deaf. If, with the use of hearing aids, they can understand spoken words more readily, no further argument need be projected for the use of hearing aids; and the special educator can have no better goal. That this "is not the solution to the educational problem" goes without saying. It would seem that the object of education (of deaf children, and of normally hearing children) is not to teach them to hear, but to help them to learn how to live a productive, satisfying, reasonably independent life in which literacy, ethical values and moral integrity become tools for living. The implication in reference that the "placing of hearing aids on children" is "the solution to the educational problem" is tantamount to suggesting that the child with a severe visual disorder (a level, say, of 20/200) is educated by virtue of the fact that he wears glasses which enable him to distinguish form and some semblance of spatial relations. This is a discursive straw man. Who, in all sincerety, would offer such an argument? And what educator, in all sincerity, would restrict the use of glasses for a child with 20/200 vision, on the ground that they do not enable him to see normally?

More Discussion of the "Educational Problem" Is Needed

There are evidently some serious problems involved in this question: hearing aids for deaf children? There are many emotional overtones; toes that have been stepped on; varied points of view in historical background; an authoritarian confusion between professional experience with hearing and experience with deafness. These negative aspects of human relations are regrettable and all too human; the basic question is much too important to be dependent upon the personal relations of this educator or that audiologist. One must assume that the "educational problem" is open for discussion, for exchange and revision of ideas, for continued experimentation and understanding.

The problems of the training of deaf children are unique in special education, largely in that the tools of the mind—hearing, language and speech—are most seriously affected by the physical handicap. (This is true, as well, in many instances of multiple handicaps, brain-damaged children, dysphasic children, and others.) The mind's normal channel for the development of these tools is basically auditory, with visual, tactile and other sensations serving as adjuncts. For the deaf child, this order of basic perception is changed;

he must learn language meanings and expression basically through visual stimulus, with auditory sensations, tactile awareness and so on as adjunctive attributes.

A basic question is this: how little residual hearing can there be still to be useful or serviceable in the deaf child's learning processes? The answer is—very little, *provided that it is put to use early and consistently, so that the mind's awareness of sound can become an active part of the child's behavior and relationship with his world.* Under ideal circumstances of case-finding and diagnosis, this is not a problem for the educator; most deaf children would simply arrive with hearing aids, having had several years of experience in exposure to sound and in putting it to use in the course of childhood development. Their awareness of sound through amplification would simply be a part of their awareness of their world, just as is residual vision for the child who arrives at the sight-saving class. Under these circumstances, the idea of ignoring the deaf child's residual hearing would simply be unthinkable.

From this perspective, the following facts and ideas are summarized for careful consideration of educators of the deaf, clinical otologists and audiologists, parents and teachers—all those whose knowledge, interests, skills and love are dedicated to the welfare of the deaf child. It is understood that some of the statements are argumentative in the sense that clear evidence is required to support them. Too much space would be required in the present context to adduce all the evidence that is available and pertinent; the critic is referred to the current literature in otology, audiology, psychology and education.

First, in modern physiologic and clinical terms, there are relatively few totally deaf children. With the advances of medical diagnosis and therapy there are only a few things which can cause total deafness. *The fact that a child is so deaf that he does not respond to ordinary sound must not be confused with total deafness.* The reserves of the human hearing mechanism are great, and can usually be reached by adequate stimulus with amplification so that at least some hearing sensation can occur.

Second, of those children with hearing impairment severe enough to interfere seriously with the development of language and speech, perhaps 30 per cent are educatively deaf. The others are potentially hard of hearing.

Third, many more than 30 per cent of the children mentioned above are currently enrolled in various schools for the deaf, and the number is apt to increase as younger and younger children are admitted prior to, or without, an adequate diagnostic work-up.

Fourth, at any given age—say, four years—there is commonly a great difference between a child's hearing potential and his actual functional response to sound. Hearing, as the term is commonly used and understood, is in part a function of the auditory end organ and in part a function of the mind's perceptual activities. The mind's understanding (use of hearing) is a learned activity, and the deaf child needs every opportunity, and every chance for auditory stimulus, to learn to use what residual hearing he has.

Fifth, in modern technologic terms, few deaf children lie beyond the reach of a powerful hearing aid. This follows from point 1, above.

Sixth, educative expectancy in the use of a hearing aid is quite different for the deaf child from what it is for the hard of hearing child. For the child who is educatively deaf, hearing at best can be only an adjunct to vision and the other perceptual modes.

Seventh, current investigations indicate beyond any reasonable doubt that the deaf child trained to see and hear simultaneously communicates better than does the child who learns to depend on either vision or hearing alone.

Eighth, *there is incontrovertible evidence that the child who is introduced early to amplified sound learns to use it and to adapt to it.* The idea that the deaf child must somehow learn what language is before he is permitted to use his residual hearing is consistently reiterated by some educators of the deaf; this idea lacks basis in fact—physiologic, neurologic, pathologic, or psychologic. The deaf child will learn so-called "natural language" best with the earliest possible use of sound, as does every other child.

Ninth, in physiologic and behavioral terms, deafness is not an entity. A group of children who are educatively deaf at any

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given stage in early development—say at age four—will typically have more different patterns of residual hearing and therefore many different levels of potentials in learning to adapt to the use of sound. Some of those with relatively good potential hearing may be quite deaf functionally; some of those with quite profound hearing impairment may learn to interpret sound quite readily. It is important in the diagnostic process that a careful measurement of each child's residual hearing be made, so that the fullest advantage of his hearing potential can be striven for. The effect of this objective, of course, is to put special emphasis on what hearing remains, rather than on what is lost.

Residual Hearing Must Be Considered In Terms of the Child's Potential

Tenth, hearing is in part a function of the auditory end organ and in part a function of the mind. There is no treatment or improvement known for a severe, bilateral, nerve-type hearing pathology, so far as the function of the end organ is concerned; but the mind can be trained to make profitable use of even minimal amounts of residual hearing, provided that amplification is used to reach the residual level. For this reason, the level of a young deaf child's residual hearing must always be considered in terms of his potential, not his immediate performance. At stake here is the difference between hearing (being aware of auditory sensations) and understanding (learning to give these sensations meaning). Most deaf children can be aware of some auditory sensation; they must learn to give it meaning. In the long run, their functional performance will be a direct product of training, of learning; if this training is geared to the idea of total deafness, and he is not given the opportunity to put what residual hearing he has to use, he will be functionally deaf. Most deaf children have enough residual hearing so that it can become an active part of their perception of and adjustment to the world around them. They need the help of daily, hourly experience with amplification.

There is good reason for society to be concerned about the fact that modern amplification is not being employed to the fullest extent in the training of deaf children. Considerable progress toward this end has been made in recent years. There remains a great deal of antipathy to the idea. It is to be hoped that the facts will consistently be re-examined, and educational philosophy and procedures modified accordingly. Hearing aids for deaf children? By all means, as early as possible.

DEATH CLAIMS THE FIRST DEAF GRADUATE OF A U. S. UNIVERSITY

A. Lincoln Fechheimer, Cincinnati, Ohio, a noted architect who was deaf from birth, died on July 29 in London, England. Mr. Fechheimer, 78, had flown there for a European vacation during which he planned to visit the Scandinavian countries. *He was the first deaf graduate of a university in this country (Columbia University, 1899).*

Mr. Fechheimer graduated from Clarke School in 1891 and in the next few years was an outstanding success as a student in hearing schools and colleges both here and abroad. After leaving Clarke School he entered the Technical School of Cincinnati, where he graduated in 1894. He graduated from Franklin School, Cincinnati, in 1895, received the Bachelor of Science degree from Columbia in 1899, and the Architecte Diplome, with honor, from L'Ecole des Beaux Arts, Paris, in 1901. Several years ago he was awarded a Fellowship in the American Institute of Architects.

Until his retirement in 1946 Mr. Fechheimer maintained an office in Cincinnati, specializing in public architecture. His contributions in Cincinnati include the Wilson Memorial Hall at the University of Cincinnati, the Zoo Reptile Building, the shelter building at Ault Park, and the Hebrew Union College. He designed a number of buildings at Clarke School—Hubbard Hall, the Skinner Building, the Coolidge Building, and others. He was a member of the Clarke School Board of Corporators from 1917 to 1946. Always interested in the oral education of deaf children, Mr. Fechheimer was a real inspiration to them and to other deaf adults. He was a member of the Alexander Graham Bell Association for the Deaf.

The Parents Talk It Over

With Harriet Montague

Marilyn Likes Her Hearing Aid

Marilyn was born in January, 1951. She has been severely hard of hearing since birth, the result of German Measles during pregnancy. It was only in recent months that tests revealed Marilyn had enough usable hearing to warrant the use of a hearing aid.

I mentioned to you some time ago that Marilyn was to go to Sydney early this year for another hearing test. We took her back in February, and were thrilled that they were able to test her and decided she could have an aid. Marilyn was very tired the day we took her, and was so irritable we were lucky to obtain a fair test. A mould was taken of her right ear, and we went back in March to get the aid. She has now used it about two months and things seem to be moving fast. I take her to Sydney every two or three weeks for special training, and she is doing well. They asked me to persevere with the aid and try to get her to wear it all day. I read the paper on hearing aids you sent me, and knew it would not be just a matter of putting an aid on her and expecting her to hear and talk; but to my surprise, she took to the instrument like a duck to water. I made a little jacket for her to wear, with pockets for the aid. I finished it one morning; and that same afternoon I took her for a walk, with the aid on. She stopped to watch two or three dogs barking across the road, and all of a sudden I realized that she was hearing them.

She wore the aid for about an hour and a half that afternoon. The next morning she had it on for three hours in the morning and another three hours in the afternoon, and she obviously liked it. She showed it proudly to members of the family and everyone we met. The next day she wore it five hours without a break, and another two hours in the evening. From that day on she has been wearing it all day and every day, from the time she gets up until the time she goes to bed.

Marilyn is taking more and more notice of sound. She recognizes her own name when spoken behind her, and she shows excitement over airplanes, cars, etc. The other day she stood for two or three minutes watching a horse and cart go down the concrete road, and kept pointing to her ear to let me know she heard it. I found her hitting two marbles together and listening to the sound.

I am very thrilled about all of this. She is getting much easier to manage. I can call her when she is outside and she will respond. She uses her voice all day, with a good range of sound, high and low tones. She is very noisy, but I gladly put up with that, for I realize that, however much she hears, it will take some time for her to learn to say words.

Marilyn, of course, had to find out how the aid switched on and off, and she learned to switch it off before removing it. A few days ago, we were all having tea and both my husband and I were talking to her, endeavoring to determine just what she could hear. Brian, Marilyn's brother, thought he'd be smart and shouted at her across the table. She put her hand to her ear, shook her finger at him, lifted up her dress, and switched the aid off.

My husband has been painting the house, and he gave Marilyn a paint brush and some pieces of wood to paint. She was very excited about it, and proud of her work. I also gave her some water color paints and big sheets of paper, and she was very keen on this, too. She enjoys working with clay, and she and her brother make little baskets of clay and fill them with clay "apples."

Marilyn seems to be understanding more and more each day, using both lipreading and hearing. Since she has been wearing the aid her progress has been much more rapid. She uses her voice like any young child learning to speak. She says no words as yet, and I know it will be quite a while before she will imitate what she hears, but it is lovely to know she is hearing our

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voices. I am not rushing her, but am enjoying with her the things she can hear.

MRS. R. W., AUSTRALIA

DEAR MRS. W:

How encouraging your letter is, Mrs. W! It is wonderful that Marilyn has accepted her hearing aid so quickly. It does not always happen that a young child takes to an amplifier right away. Sometimes it is necessary to let him see other children using aids and wearing the little buttons in their ears before he will consent to leave his on. On the other hand, when a child does like wearing an aid, he wants it all the time. One mother wrote me just the other day that after her little girl used a table aid at school, she associated lessons with earphones and now will not have a lesson at home unless she has earphones on.

It is fascinating to watch a child react to sound. Marilyn heard the dogs bark and the sound of the horse's hooves on the pavement. She enjoys making noises herself and listening to them. As she grows more familiar with the sounds of speech, she will be more quickly responsive to them, and will even start imitating words.

That was most interesting about her switching the aid off when her brother shouted at her. A little girl who attended one of the classes at the New York League for the Hard of Hearing, some years ago, had a temper tantrum in class one day and began to cry loudly. She looked startled for a moment at the sound of her own crying, then she reached down, switched off her hearing aid, and went on with her tantrum. When she finished being mad, she switched the aid on again.

Introducing Jimmie to His Relatives

Jimmie is three and a half. The cause of his deafness is not known. It has not yet been determined whether he has usable hearing.

We have been having visitors all summer. Since Easter I have had either my family or my husband's family every other week end. We left our home three years ago and nobody in our family has seen Jimmie since he was a tiny baby. They all decided this was the year to visit us and see him.

I did not want them to frighten him or undo all the work I had done during the

winter starting him in lipreading and language, so I decided to prepare Jimmie and his relatives for one another. I got pictures of all the aunts and cousins and uncles and grandparents, and showed them to Jimmie every day, naming them each time. He was very much interested, and actually learned to lipread some of their names, so I could ask him, "Where's Uncle Joe? And he would point to the right picture.

We had to change sleeping arrangements each time a new set of company came, so when I made the beds I put the picture of each coming visitor on the pillow of the bed he or she was to occupy, and showed Jimmie that that person was to sleep in that bed. They usually arrived during the night after Jimmie had gone to bed, but he was all ready for them and they were often awakened in the morning by Jimmie with their pictures in his hand.

The way he accepted them all, looked at his scrapbooks with them, and showed them his "What's Its Name?" book was wonderful. I had briefed them all in advance how to act with Jimmie and how to talk to him, so all went well. They all talked to him, and they thought it was wonderful the way he seemed to understand, and the way he could make us understand through facial expressions and gestures. Jimmie does seem to understand more every day. He also thinks that everyone else reads lips. If he wants any of us, no matter what we are doing, he will come and turn our faces around, so we can look at him while he "talks" to us.

We have a fenced-in back yard with a sandbox, swing and picnic table. We do our lessons on the picnic table under the apple tree. We have seldom been alone for a lesson this past summer, but Jimmie is accepting his sisters and his other relatives as teachers, too.

MRS. J. B., MICHIGAN

DEAR MRS. B:

Good for you, Mrs. B., you took the bull by the horns, showed uninformed relatives how to treat a little deaf boy, and not only did some good missionary work but helped Jimmie enjoy the experience. I think there are a lot of things in all of these letters that other mothers of deaf children will enjoy reading about and imitating.

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This is a special telephone for the hard-of-hearing. . . . It has a built-in amplifier controlled by the little button you see here. You can set it for low, medium or high so that the telephone voices can be easily heard.
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The Spruces Kensington, Maryland

The Rehabilitation of a Deafened Boy

DOROTHEA ELKAN

ROGER, age five, was admitted to our small school for totally and severely deaf children in May 1953, after having suffered from a short but severe attack of pneumococcal meningitis in February. After a three-week stay in the hospital he was dismissed as "well in all respects," but suffering from total deafness and a slight impairment of his equilibrium.

Many Difficulties to Overcome

In school, of course, he had to overcome greater difficulties than other newcomers. Apart from the shock of finding himself suddenly in a silent world, he suffered very much from homesickness which has been all the worse for him for being separated from his twin brother whom he loves dearly. Roger had an astonishingly fluent and precocious way of expressing himself. So he remarked that it was a shame that he had become deaf and wanted to know whether he would always be inclined to fall.

Lipreading Progress Is Rapid

His progress in lipreading has given me the greatest surprise and thrill. I started him off in the same way as the congenitally deaf children. I showed him pictures of children in action and told him to act likewise, (*e.g.* knock at the door). From the first he could lipread these short sentences when said to him for the second time, without being shown the pictures. I have been teaching another boy of six, called Leslie, who also became deaf after meningitis but who did not enter school until two years after the onset of deafness. Though he is an intelligent child he has not made as much progress in nine months as Roger has made in about seven weeks. Leslie has lost his speech and language completely, as have other children in similar circumstances in our school. I took Roger four times a week for half an hour's private lesson. In addition he was taught in a class of seven-and eight-year-old children and after seven weeks was able to follow the lessons without difficulty. Therefore the private lessons were discontinued.

Roger was used to reading phonetically and found it hard to adopt the "look and see" method which naturally is a great asset toward quick lipreading. According to his mother he is now much better at reading than his brother.

Roger was most astonished when I told him that all the children in our school could not hear. He still does not fully realize this and often gets annoyed when the children cannot understand him. When I spoke the numbers—up to five—into his ear, after having told him before what I was going to do, he turned to the other children, again not being aware that they could not grasp what he was about to say, and told them that deafness was not too bad as one could hear by feeling the "wind." He was able to distinguish the numbers by their breath and explosive consonants. He is a weekly boarder, as are the majority of our children. During the first weeks he was very unwilling to return to school on Monday mornings but now it is his brother who cries when Roger leaves. The two little boys had become rather estranged after Roger had become deaf, but now that the hearing brother can make himself understood he hates Roger's leaving him. Roger is often miserable after school hours, but is getting over it. He holds long conversations with the staff —a good sign of his rehabilitation.

Early Training Is Important

There are great possibilities for children deafened by meningitis, or any other disease, if taught to lipread and to work on speech and language as soon as their recovery permits such instruction. It is a great pity that while so much is done for the congenitally deaf, no special schools are provided for these most tragic cases of deaf children.

Miss Elkan is a teacher at the Hurtwood School, Peaslake nr. Guildford, Surrey, England.

Book Notes and Reviews

Trips and Treats, by Mary E. Numbers and Margaret Kennedy. Clarke School for the Deaf, Northampton, Mass., 1954. 75 pages. Illustrated. $1.50 plus postage.

This is a book that will broaden and enrich the learning experience of every deaf child of intermediate age. It will be welcomed by both teachers and parents as a live tool in stimulating the desire to learn and use language, and will be especially valuable in helping children to learn to read with real comprehension. In this light its value is not restricted to children with hearing losses, but it will also develop better basic reading skills in normally hearing children.

It is a collection of practical, live, ready-to-use material designed to motivate the development of language needed in everyday situations. The book contains 18 stories that deal with the everyday trips of one family in and about their community —In the Shoe Shop, At the Drug Store, In the Restaurant, etc. Each story is accompanied by two sets of factfinding and thought-provoking questions. Eighteen full-page illustrations have carefully planned details to aid in teaching the meanings of new words encountered in the stories.

The book has been carefully edited. In testing its value the authors have used it with classes in the Middle School at the Clarke School for the Deaf and it will be a valuable addition to the curriculum of all other schools for hearing impaired children.—*Alice A. Kent, Supervisor of Classes for Deaf and Hard of Hearing, East Cleveland, Ohio.*

Language Book 1, by Mary E. Numbers. Clarke School for the Deaf, Northampton, Mass., 1954. 78 pages. Illustrated. $1.50 plus postage.

From the wealth of her experience, and with her unfailing insight and understanding of the difficulties confronting the deaf child in his acquisition of language, Miss Numbers has written this book to be used with pupils on the middle school level.

In the foreword to teachers, Miss Numbers emphasizes the fact that even the most careful and systematic oral teaching needs the reinforcement of written practice. With this in mind the lessons have been carefully planned, not only to increase the child's understanding and broaden his use of each principle involved, but to test his comprehension as well.

This book is much more than a workbook for it can serve as a reliable guide for the inexperienced teacher, while the teacher of experience will find in it a great variety of supplementary material which can be used according to the needs of her class.

The vocabulary is as up to date as "Scrabble," and the sentences, short topics and stories cover the natural activities and experiences of all children which will be of interest while the pupils are becoming more and more familiar with: pronouns and their antecedents; tenses; verb forms; contractions; the use of the infinitive; the present participle; infinitives and participles; punctuation; direct and indirect quotations, and many more lessons all aimed at giving the child in his formative middle years a working knowledge of basic language principles.

This book is No. 1, which it is hoped is but the forerunner of others by Miss Numbers in this important field.—*Margaret Bodycomb.*

Clinician's Handbook for Auditory Training, by J. C. Kelly. Wm. C. Brown Co., Dubuque, Iowa, 1953. 155 pages, spiral binding.

Clinician's Handbook for Auditory Training consists of a series of drills which, according to the author, lead to "greater attention in listening, improved discrimination for the sounds of speech, and improved auditory memory span." It is planned for the use of special teachers of hard of hearing children over 10 years of age, and adults, in a school or educational setting.

The drills consist of practice in repeating numbers (for vowel discrimination), repeating letters (for consonant discrimination), repeating unrelated words, and

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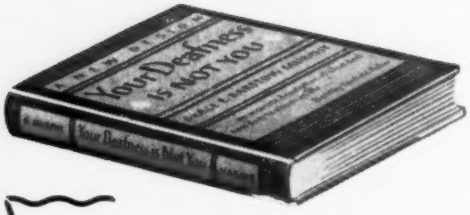

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answering questions about brief paragraphs. A sample of one of the lessons on numbers, for example, has the teacher saying "four four two four" and the pupil repeating or writing down the numbers he hears. The same procedure is used with letters, such as "AZM HNB."

The lesson material is tedious and dull, a fact which the author admits and apparently considers to be a virtue. "For the teacher who feels that the child must be entertained in the speech clinic," he writes, "supplementary activities are recommended." With this recommendation we agree.

Somewhat disturbing to this reviewer is the discussion in the introductory chapters of this handbook regarding the audiogram versus the speech-hearing ability (or auditory discrimination) of the pupil. Mr. Kelly refers to the "disagreement" between the two factors, and to the "independence" of these two functions of hearing. Common sense as well as clinical experience has demonstrated that the two are most definitely related as aspects of the hearing function, even though one factor does not predict the other directly. To phrase the scientific fact in lay terms, obviously speech must be loud enough to be heard for the pupil to understand it, though loudness alone does not guarantee understanding. To suggest, as the author does, that a hearing aid may be properly selected (or rejected) on the basis of discrimination scores alone (ignoring the amount of effective acoustic gain provided by the aid) could lead to serious clinical errors.

Also disturbing is the author's confusing terminology. The title of the handbook itself refers to the "clinician," but the introduction indicates that the book is for the use of special teachers in school having a minimum of electronic equipment. A "clinic," according to the understanding of this reviewer, supported by Webster, refers to a hospital or medical setting. But to the author, a "clinic" in this sense becomes a "laboratory." Also in reporting the results of an experiment, the author uses the term "word intelligibility threshold (in db)" to mean what is generally meant by the terms "speech-reception threshold" or "speech-hearing threshold." He also uses the term "speech-reception (in per cent)" to mean

what almost everybody else means by the terms "auditory discrimination score" or "intelligibility score."

The drills themselves, nevertheless, have been painstakingly devised and could well be used as a part of each auditory training session with older children and adults.—*Edna K. Monsees*

In the Magazines

"Causes of Deafness in Young Children," by Edmund P. Fowler, Jr. M.D., and Milos Basek, M.D. *A.M.A. Archives of Otolaryngology*, 59: 476-84, April 1954. A report based on case studies of 270 children having permanent deafness.

"The Inarticulate Child: A Problem in Diagnosis," by J. W. McLaurin, M.D. *The Laryngoscope*, 64:454-66, June 1954. Presents "a technique of history-taking, auditory testing and clinical evaluation of the total child," and outlines criteria of differential diagnosis.

"Industrial Noise and Occupational Deafness," by Harry A. Nelson. *The Laryngoscope*, 64:568-79, July 1954. Mr. Nelson, of the Workmen's Compensation Division, Industrial Commission of Wisconsin, prepared this article for the annual meeting of the American Laryngological, Rhinological, and Otological Society, Boston, May 1954.

"Intelligibility of Different Speech Materials," by I. J. Hirsh, Elizabeth G. Reynolds, and Maurice Joseph. *Journal of the Acoustical Society of America*, 26:530-38, July 1954. A report of a study carried out in connection with a contract between the Central Institute for the Deaf and the U.S. Air Force.

"The Measurement of Hearing Loss in Adults by Galvanic Skin Response," by Leo G. Doerfler and Catherine T. McClure. *Journal of Speech and Hearing Disorders*, 19:184-89, June 1954. An article based on a paper presented at the 1952 convention of the American Speech and Hearing Association.

"A Visual-Tactile System of Phonetical Symbolization," by A. Zaliouk. *Journal of Speech and Hearing Disorders*, 19:190-207, June 1954. A description of the system applied for the past several years at the Institute for the Deaf in Haifa, Israel. Dr. Zaliouk is director of the Institute.

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NEWS

Dr. Fairchild Dies

Dr. David Fairchild, internationally famous author, explorer and naturalist, died on August 6 in Miami, Florida, at the age of 85. Dr. Fairchild was a son-in-law of Alexander Graham Bell and a member of the Honorary Board of Directors of the Alexander Graham Bell Association for the Deaf. For many years Dr. Fairchild was head of the Plant Introduction Office of the U. S. Department of Agriculture. By his introduction of plants from all parts of the world, he was credited with increasing agricultural production in this country by more than 100 million dollars per year. Mrs. Fairchild, the former Marian Bell, is also a member of the Association's Honorary Board.

New Canadian School

The Department of Education of the Province of Alberta, Canada, has made plans to build a school for the deaf within the province. L. A. Broughton has been named superintendent of the school, which is tentatively scheduled to open in the fall of 1955.

Since 1924, deaf children of Alberta have had to receive their special education outside the province at Saskatoon, Montreal and Vancouver. This has meant that the children have had to spend long periods away from home, in most cases from September to June, because of the travel involved to and from school.

Before the opening of the new school Mr. Broughton will study at several teacher-training centers in Canada and the U. S, and possibly England.

Death Claims Dr. Sherman K. Smith

Dr. Sherman K. Smith, director and founder of the Sherman K. Smith School of Speech and Oral Education, Tampa, Florida, died on September 7 in Tampa. Dr. Smith established his school in 1946 for the oral education of deaf and hard of hearing children, and the rehabilitation of speech. He operated the school on a 12-month schedule and trained children from nursery school through high school. The

NOTES

school is affiliated with the University of Tampa.

Heads of Schools Named

Lloyd A. Harrison, formerly assistant superintendent and principal of the Advanced Department of the Missouri School for the Deaf, Fulton, was recently named superintendent of the school. Mr. Harrison succeeds Dr. Truman L. Ingle whose death, on May 25, 1954, was reported in the June issue of the *Volta Review*.

Harold W. Green has been appointed superintendent of the Utah Schools for the Deaf and Blind, Ogden, succeeding Dr. Boyd E. Nelson. Mr. Green has been serving as acting superintendent of the schools for the past several months.

Roy Moore Stelle has been named superintendent of the Colorado School for the Deaf and Blind, Colorado Springs. Mr. Stelle, formerly superintendent of the Texas School for the Deaf, Austin, succeeds Dr. Alfred M. Brown who recently retired. John F. Grace, formerly principal of the Gallaudet Day School for the Deaf, St. Louis, has been appointed to succeed Mr. Stelle as superintendent of the Texas School.

The Pennsylvania State Oral School for the Deaf, Scranton, has announced the appointment of Mrs. Helen S. Bissell as principal. Mrs. Bissell succeeds Miss Mary B. Evans.

Teacher Training Program at Los Angeles State College

The Los Angeles State College has announced affiliation with the California School for the Deaf, Riverside, to train teachers of the deaf. This affiliation represents an extension of the existing program. Under the new arrangements the required year of special training may be taken on the college campus, with laboratory experience at the Mary E. Bennett School, Los Angeles, or at the Riverside School.

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Riverside or San Bernardino. After completing a year of training at the California School they will spend their senior year on the Los Angeles State College campus where they will receive additional laboratory experience in the day schools of Los Angeles. Graduates of the program will receive the A. B. degree and a certificate issued by the college.

Wright Oral Graduate To Practice Orthodontics

James Marsters, D.D.S., a 1943 graduate of the Wright Oral School, has recently opened an office in Pasadena, Calif., for the exclusive practice of orthodontics. Following his graduation from the Wright Oral School Dr. Marsters, who has a severe hearing loss, received degrees from Union College (1947) and the College of the City of New York (1950). From 1951-53 he attended the University of California.

Relief for the Retired Teacher

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Auditory Training

(Continued from page 354)

depends upon such factors as individual intelligence, onset of impairment, motivation, interest, the skill and ingenuity of teachers, the excellence of equipment and material available, the method and approach used, the continuity of the auditory training program, etc. Auditory disorders are varied and can be adequately dealt with only after careful diagnostic study. The benefit to be derived from a specific auditory training routine varies with each individual case. There is probably no foolproof method of determining in advance the degree of success to be expected. Because of this, we are probably inclined to use amplification remedially on many youngsters whose chances for success are somewhat slim.

As to specifics for an adequate auditory training program, it is again difficult to be arbitrary and positive. Any such program must be flexible and must have continuity. With certain individuals, wearable aids should be worn during all waking hours. With others, whose auditory impairment is great, only short auditory training periods are suggested. Above all, great care should be exercised in the initial phases of an auditory training program. A child's first exposure to amplified sound should be as pleasant an experience as is possible for us to make it. With still other individuals it is feasible to use group amplification equipment during most or all of the instructional day. Formal auditory training periods, presided over by trained personnel, in many situations have a definite value. The important factors are that we, as educators, keep an open mind, understand the many ramifications of this complicated problem, be honest and accurate in our dealings with and promises to parents, believe in the possibilities and potentialities of an expanding auditory training program designed to exploit any element of auditory acuity present, and, finally, we must be cognizant of the fact that there are certain definite limitations.

EDITOR'S NOTE: *Papers by other members of the auditory training panel will appear in the November* Volta Review, *together with a summary of the general discussion which followed.*

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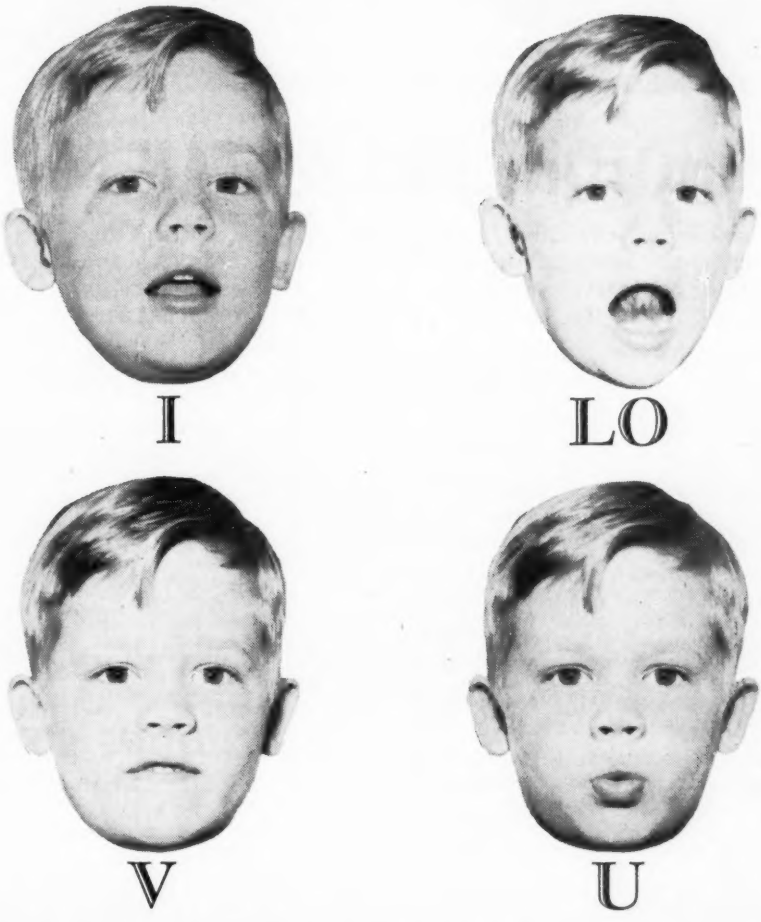

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COVER

The feature article in this issue of the *Volta Review*, "Teaching Speech to the Deaf—The Issues," was written by Dr. S. Richard Silverman, director of the Central Institute for the Deaf, St. Louis, Mo. The cover shows a young pupil at Central Institute as he practices saying "I love you."

THE ALEXANDER GRAHAM BELL ASSOCIATION FOR THE DEAF welcomes to its membership all who are interested in improving the education of the deaf and the hard of hearing, their ability to communicate with those who hear normally, and their adjustment to life in the hearing world. Its membership fee ($5 a year—$100 for life) includes a subscription to *The Volta Review*.

THE VOLTA BUREAU, headquarters of the Association, is an information center about deafness, founded by Alexander Graham Bell in 1887. Its library on deafness and speech is probably the largest in the world, containing books in twenty or more languages.

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Teaching Speech to the Deaf ---The Issues[1]

S. Richard Silverman

A RETROSPECTIVE view of the purposes and activities of our association reflected by our periodic statements of policy, by our deliberations at summer meetings, by the content of our publications and by our chosen leadership, reveals that through the years we have been concerned with the over-all growth and development of the deaf child in general and with the oral means of communication in particular. To review the evolution of this philosophic focus is beyond the scope of this paper. Furthermore, most of us are or ought to be familiar with the engrossing story that waits upon some gifted historian to set it down in proper perspective. Rather, we need to point up that our stated purposes commit us to open professional discussion of the issues that permeate the teaching of speech to the deaf. It is needless for me to remind this audience that indifference to our responsibility for critical and dispassionate assessment of our approach to speech is likely to jeopardize the foundation upon which our educational and social outlook for the deaf child rests. The need is real and vital. Its satisfaction should have import for the schoolroom, the home and the playground far beyond the limits of an academic exercise geared to professional promptings and urgings.

Simply stated, we need *always* to improve the speech of our deaf children. This is not accomplished by eloquent and moving exhortations. Ideally it would be well to seek the answers through the findings of wise research implemented in the classroom and finally validated by the talker's everyday performance in communicating with the people about him. We respect the industrious observations and studied conclusions of the laboratory investigator, but at the present time all the pertinent experiments have not been done and more and more incontrovertible evidence is necessary. Fortunately, we have available to us a rich store of accumulated experience leading by and large to a seasoned wisdom. This morning's panel presentation will draw on this pool of knowledge and experience with the end in view of improving our individual and aggregate competence. It is the purpose of this paper to furnish the backdrop for that discussion by delineating significant points of issue about crucial aspects of teaching speech to the deaf.

Fundamental Attitudes

Whatever our pedagogical genesis, we professionals endorse the proposition that all deaf children shall have an opportunity to learn to speak. But the implementation of this notion finds us fundamentally and sharply at issue. There are those among us for whom a corollary to the proposition of universality of opportunity is inescapable; and that is that speech is a basic means of communication and hence a mechanism of adjustment to the communicating world about us. Therefore we must so set the stage for the child *everywhere*, including the home, from the moment we learn that he is deaf, so that speech becomes meaningful, significant and purposeful for him at all times. It is argued that only practice stemming from this attitude will realize the deaf child's maximum potential for communication by speech—and that potential, properly tapped, is said to be greater than is generally granted and than the average results indicate.

On the other hand there are others in our midst who look upon speech (or carry on their programs in such a way) as a subject to be taught like Spanish in high school to those who can "benefit" from it. Practice and atmosphere, if you please, are not aimed at vitalizing speech for the child. Rather, speech is viewed as a

[1]An address delivered to the Sixty-third Summer Meeting of the Alexander Graham Bell Association for the Deaf, St. Louis, Missouri, June 18, 1954.

Dr. Silverman is director of the Central Institute for the Deaf, St. Louis, and professor of audiology at Washington University.

desirable but not essential skill to cultivate and it may serve a purpose on certain occasions much as Spanish may be useful (in an agonizing and frustrating way) for those blessed few North Americans who may some day have an opportunity to experience the enchantment of the wistful and languid lands south of the border. Here then, in the spirit of our Summer Meeting theme so far as it concerns the teaching of speech, is the basic issue we must face.

The Multisensory Approach

Obviously we agree that we must use optimally the sensory channels available to us for teaching speech to the deaf child. Significant for us are the visual, the auditory, the tactile and the kinesthetic pathways and the popular approaches associated with them.

When we consider the uses to which we put the visual system in teaching speech we tend to think primarily of lipreading as the child learns to watch with purpose the movements of the lips (and expressions of the face) of those about him and to imitate, however imperfectly, these movements in attempts to express himself. In addition to lipreading, other well-known visual approaches include systems of orthography (diacritical marks, Northampton Charts, Alcorn symbols) about which I shall have more to say later, color codes that distinguish the manner of production of phonetic elements, models and diagrams that show position and movement of the mechanisms of speech and acoustic translators of various sorts that display speech patterns visually and can carry information to the eye about time, frequency and intensity. The latter range from what we used to call pitch indicators to the elaborate and complex visible speech apparatus designed and developed at the Bell Telephone Laboratories.

We know that the literature of more than a century ago mentions the desirability of using the auditory system to aid in teaching speech to the deaf. But today we are better able to exploit this possibility because of the development of modern group and wearable hearing aids designed to deliver speech to the auditory area useful to the child.[2] We know that for most of our children the auditory area is greatly restricted but even the perception of stress patterns can be helpful in achieving better temporal patterns, control of intensity, pitch of the voice, and understanding of the talker.

The tactile or vibratory sense is most commonly used by stimulating the child's fingertips in contact with his own or the teacher's face or head during speech or just phonation. Some of our techniques involve also the use of sounding boards and diaphragms which are caused to vibrate.

The muscle sense is used in "getting the feel" of certain articulatory and vocal movements and in tongue and lip exercises. Some teachers employ rhythmic gross muscle movements and babbling to reinforce kinesthetically utterances consisting of connected speech and suitable nonsense syllables. The chewing approach may fall in this category.

Many of us will recognize our pet ideas in this brief recapitulation of the teaching techniques, approaches (call them what you will) specifically related to the sensory systems. Others will wonder why I bothered to mention what should be clearly obvious to this audience and about which there is no apparent issue.

But there is an issue and it has critical significance for classroom practice. The issue arises from the differences of opinion concerning the relative emphasis to be placed on specific sensory pathways. The controversy ranges from the concept of mutual reinforcement by deliberately using the senses together—a coordinated sensory input—to the notion that speech will be better learned if stimulation by one sense is purposely excluded in order to achieve optimum performance by another sense. The first group in speaking of vision and hearing tells us that the eyes and the ears together perceive speech better than either one alone[3] and that early training should be based on this concept. The other group argues that lipreading should be excluded from auditory training because it (lipreading) will divert the child from optimum use of his hearing;[4] or in training the

[2]Silverman, S. R., "The Implications for Schools for the Deaf of Recent Research on Hearing Aids," *American Annals of the Deaf*, September 1949, pp. 325-39.

[3]Hudgins, C. V., "Problems of Speech Comprehension in Deaf Children." *The Nervous Child*, January 1951, pp.57-63.

[4]Huizing, H. C., "Paedo-Audiology: Its Present Status and Future Development." *Proceedings of the International Course in Paedo-Audiology*, Groningen University, June 1953, pp.114-23.

vibratory sense the eyes of the child should be blindfolded.

We see this issue indirectly reflected in the conflicting views about the visual perception of deaf children — the one view holding that the visual perception of deaf children is relatively restricted because of lack of reinforcement by hearing, and the other view that the deaf have relatively superior visual perception because they must depend primarily on vision to make contact with the world and after all practice makes perfect. Clearly we need to add to our knowledge information about how the deaf child handles visual and other sensory tasks and thus to test some of the assumptions on which our procedures appear to be based. For example, how specific is the information about speech that is carried over the tactile system? How efficiently does the eye handle information intended primarily for the ear? What about the span of perception, fluctuations of perception, grouping of stimuli, influence of context and precision of perception as they relate to the visual competence of the deaf child?

These and related questions leave no doubt about the pertinence of the issue of optimum uses of the senses in teaching speech.

Systems of Orthography

All of us are aware of what amounts to the irrationality of the choice and use of our symbols to stand for discrete units of speech. The shape and size of the letters of our alphabet bear no logical or consistent relation to the sounds they are intended to represent. Furthermore, most of our symbols represent more than one sound and most of our sounds are represented by more than one symbol. This situation has stimulated teachers of the deaf, among others, to devise or to adapt a system of orthography that would carry more information about phonetic elements than the unrelated letters of the alphabet.

We recall how the Bells[5] created their system of visible speech wherein four fundamental consonant curves related to the articulators—the back of the tongue, the top of the tongue, the point of the tongue and the lips; and appropriate modification of the basic vowel symbol indicated the production of the vowels. For example, for the consonants ◘ = k, Ω = sh, ◡ = t, ◘ = p.

We know about the Northampton Charts that are arranged to give more phonetic significance to letters of the alphabet through their voice, breath and nasal columns and similarity of production rows for consonants and suitable categorizing columns and rows for vowels. The multiplicity of symbols representing the same sound is handled by a system of appropriately arranged secondary spellings under the primary symbol which presumably occurs most frequently in English usage. Thus *o-e* is the primary symbol for the dipthong in *home*, the dash representing a consonant. A secondary spelling under *o-e* is *oa* as in *boat*.

Of course, we are familiar with the diacritical system used in our dictionaries based on the concept of familiarity with the pronunciation of frequently used key words. Where one letter may represent more than one sound a differentiating symbol is used; thus *e* as in *be* is *ē*, and *e* as in *bed* is *ĕ*.

Phoneticians and linguists generally use the International Phonetic Alphabet which has a single agreed-upon symbol for each sound and supplements the existing alphabet with symbols to fill out the needed representations.

There have been other attempts too numerous to mention that have sought through shorthand or other means to convey phonetic information through a logical and consistent system of symbolization. Our search for these systems underlines our agreement on the need for one or more in teaching speech to the deaf. To have or not to have a system is not the question, but we seem to suffer the slings and arrows of outrageous phonetic fortune when we have to make a choice among systems.

We appear to differ in the criteria that guide our choice. If we were looking for symbols that convey information on how to articulate we would probably choose the visible speech of the Bells. The Northampton Charts with secondary spellings included would probably be representative of most frequently occurring symbols and symbol combinations in the English language, and hence would be likely to contribute to pronunciation. On the other hand, because there are so many secondary

[5]Bell, A. M., *Sounds and Their Relations*. Washington, D. C.: Volta Bureau, 1894.

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spellings and exceptions, the learned symbols may be confusing out of chart contexts. The diacritical markings are obviously useful but everyday English symbolization does not carry the differentiating symbols. This is in essence one of the drawbacks, for our purposes, of the International Phonetic Alphabet. Some teachers prefer to start children with the Northampton Charts and then to teach the diacritical marks when the children reach the appropriate academic level. These arguments are by no means exhaustive but they point up the issues related to systems of orthography.

Units of Speech

In teaching speech to the deaf we tend to favor a particular unit of speech that appears to be most suitable to our particular needs. Yet we differ in the choice of unit. In this context the various approaches to teaching articulation to the deaf may be properly placed on a continuum ranging from an elemental, analytical method to a patterned or "natural" approach. The former would emphasize the development of individual elements out of phonetic contexts and the latter would begin with words and phrases "as is natural for hearing children to do." The "elementalists" argue that in the absence of an appropriate auditory monitor the kinesthesia of each phonetic element must be fixed before precise articulation can be achieved and fluency is not attained at the expense of good articulation. The "naturalists" contend that we must take advantage of the spontaneous articulations, temporal pattern and voice qualities of young children. These are not generally isolated elements and precision can be achieved within the framework of the natural spontaneous vocal output without sacrificing fluency.

It is obvious that we have caricatured the two extremes of the continuum and that the competent teacher is not wedded exclusively to either. It would be remiss not to mention a predominant school of thought that places the emphasis somewhere in the middle of the continuum and that correction or development of individual sounds should not be considered complete until they are placed in the kinds of syllables in which they are likely to occur. Hence the syllabic unit is fundamental.

It is not without interest to insert here Stetson's[6] view that the syllable is the simplest possible utterance in a monosyllabic breath group. Individual "sounds" cannot be discussed without involving their function in a syllable. Stetson maintained that "when teachers and demonstrators give what they think are 'separate sounds' they are actually uttering syllables; the vowels and on occasion the liquids and nasals constitute separate syllables, as in 'oh, a, rr . . . ., ll . . . ;' long drawn out fricatives, sss . . . . etc. become vowel substitutes, the other consonants are given with a brief vowel as in 'buh, puh' . . . ."

As we delineate the issue dealing with the desirable unit for teaching speech it is not out of order to express concern about our apparent failure to capitalize in later speech development on the spontaneous utterances of the very young child. Irwin[7] has studied carefully the development of sounds in young hearing children and he has shown that by the tenth month practically all of the different sounds have appeared. Yet it is curious that even though a child may have produced *l* and *r* during his infantile babbling he frequently cannot at the age of two or three produce these sounds correctly in English words.[8] Apparently he finds it difficult to use the phonetic elements of his babbling as the phonemes of his language. This relearning comes about by perceptive development, both auditory and kinesthetic, and in the case of the deaf child by whatever sensory potential is available and in a relatively flexible and adaptive sequence.

Evaluation of Speech

In discussing the issues involved in the teaching of speech to the deaf, it seems necessary for us to consider the question of the evaluation of the results of speech teaching. Some time ago I pointed out[9] that attempts at evaluation may fall into two related categories, the first dealing

[6]Stetson, R. H., *Motor Phonetics*. Amsterdam: North Holland Publishing Co., 1951, p.27. (Available through Oberlin College.)

[7]Irwin, O. C., "Infant Speech: Consonantal Sounds According to Place of Articulation." *Journal of Speech and Hearing Disorders*, December 1947, pp.397-401.

[8]Jakobson, R., *Kindersprache, Aphasie und Allgemeine Lautgesetze*. Uppsala: Almqvist & Wiksell, 1941. (Cited by Miller, G. A. *Language and Communication*. New York: McGraw-Hill, 1951, p.146.)

[9]Silverman, S. R., "The Speech Program of Central Institute for the Deaf." *Volta Review*, January 1943, pp.12-15,56.

with the periodic evaluation during the school career of the child, in which he is formally exposed to the speech program, and the second involving long range evaluative procedures which are designed to discover how effectively previous speech training functions in post-school life. These categories, although significantly related, merit individual treatment.

Evaluative techniques used periodically to measure speech progress and to determine individual speech difficulties have not yet attained the degree of objectivity comparable to that achieved by measuring and diagnostic instruments in the subject matter and skill fields. Among the more popular techniques designed to approach objectivity is the procedure in which a child reads a selection and an auditor indicates the extent to which the selection has been understood. Although this evaluative technique may yield a limited appraisal of the child's speech mechanics, it neglects to evaluate the psychic aspect of speech previously discussed. This situation does not simulate the pattern of usual oral intercourse in which the child does not have the benefit of the printed or written selection which serves as a visual crutch. What is being evaluated is a form of *oral reading* and not speech in terms of the broader social objective stated at the outset of the present report. The translation of the child's *own* thoughts into intelligible speech is an ability neglected by this type of evaluation.

The use of memorized material without the aid of a visual crutch is subject to similar criticism since the thoughts expressed usually do not originate in the child and if they do, the process of memorization furnishes the child an advantage which does not operate in a normal speech situation. The interview approach to evaluation, in which the child is stimulated to talk freely, may approximate true appraisal of speech if it is conducted skillfully, but, very often in this situation, anticipation of answers to questions may operate to the child's advantage and the technique fails to appraise the child's ability to take the initiative in speech.

The use of speech recordings as a periodic evaluative and diagnostic technique has considerable value provided the procedure employed in obtaining a sample of the child's speech is not subject to the limitations mentioned above. The read or memorized selection, or question and answer type of recording, is questionable. Of course, it would be fruitful for us to capture the casual conversations of our children for study.

The outcomes of the speech program which are most important in the long run, however, are those which involve the extent to which the child's speech training received during his school years functions adequately in post-school life. I suppose that we need to correspond directly with our graduates about how they are getting along, and we must also have them come back for whatever evaluation it is feasible to make. It is recognized that although such appraisal lacks objectivity and structure, it does lead to self-evaluation on the part of former students and stimulates them to utilize to an optimum degree of effectiveness the speech training that they received in school.

A Summary of the Issues

In summary we can restate the paramount issues in teaching speech to the deaf in the following questions:

1. What is our fundamental attitude toward teaching speech?
2. How can we best utilize the child's sensory potential?
3. What system or systems of orthography contribute most to the development of speech?
4. What unit of speech is most advantageous for teaching?
5. How can we best evaluate the results of our teaching?

Finally, we must constantly keep in mind that the prime objective of our speech work is intelligible speech—intelligible to all with whom the child comes in contact. One may reasonably question the possibility of attainment of so lofty and broad a purpose but this ideal must serve, nevertheless, as the basic motivating force of all speech teaching. The adoption of an ideal implies an abiding faith in its attainment, the sincerity of which inevitably effects methods and results. It means the faith of those who have preceded us in this association—particularly the man whose name it bears. The teacher who lacks profound faith in the merits of teaching speech invariably lacks ingenuity in devising methods of meeting speech needs of individual

(*See "Teaching of Speech," page* 417)

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The Nursery in a Day School

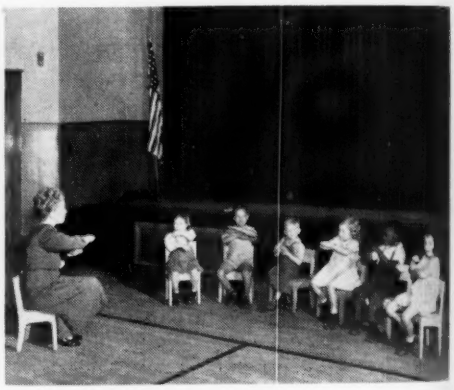
MRS. EUNICE L. HEINRICHS

IT was a new semester. Ten new babies entered the nursery. The hard-won, smooth functioning of the nursery school program had been temporarily interrupted. New babies heartily proclaimed their alarm and disapproval of the strange new situation. Robert screamed at the top of his lungs after Mother left him; he was not to be cajoled into any of the activities. Little Paul, whose one eye has been removed and who had cause, through too great experience with doctors and hospitals, to fear new situations, clung tenaciously to his mother. Poor Gary (a spastic much older and larger than the others) got in everyone's way. Dainty little Kathleen and Richard, who both had been in prenursery school, joined the former pupils in observing the goings-on of their new classmates with wide-eyed surprise and the *savoir-faire* of experience.

Three excellent mature teachers comforted and guided the 21 pupils, grouped them, and challenged the babies with pleasurable activities. They helped the little ones to the downstairs dining room, where luncheon, planned for the youngest children, is served while the older ones eat in the large school cafeteria. Another trial time, later in the day, was the nap period. Some of the little ones burst out crying again, at being in a strange sleeping room. Peter went from bed to bed to annoy or strike; Dickie thought it a marvelous opportunity for an obstacle race, climbing over the low wooden screens separating the little individual cots.

That was several weeks ago. Now the rhythm of work and play, wash, eat, and sleep, is well established. The only one who still cries is three-year-old Richard, who struggles and screams when his mother wants to leave him—Oh, no!—when she wants to take him home.

The special speech teacher takes the pupils individually for speech and auditory training, continuing the last semester's program, and including the new babies only as they are emotionally and socially adjusted. This she does only after they have gained confidence in their surroundings, feel secure, and have learned to watch the faces of their teachers.



A rhythm exercise at the Alexander Graham Bell School, Cleveland. Pictured with the class is Mrs. Marie B. Lewis, teacher in charge of Nursery I. (Photo by Division of Visual Education, Board of Education, Cleveland.)

This speech teacher has a warm personality, and the babies love her and work well with her. She trains them to good work habits, putting puzzles together or crayoning or some other interesting activity, while she works with them—one at a time. According to their stage of advancement, they listen to gross sounds, imitate breath and voice sounds and the whole words that have meaning for them. Of course, the visual, tactile and auditory methods are used simultaneously.

While individual speech is taught, the groups still in the nursery are having sense training to improve observation and discrimination in learning form and matching

Mrs. Heinrichs is principal of the Alexander Graham Bell School, Cleveland, Ohio, and supervising principal of that city's three hearing conservation centers. She is also a member of the Auxiliary Board of the Alexander Graham Bell Association for the Deaf. Her article is based on a report given in March 1950 at the convention of the International Council for Exceptional Children.

colors. They practice exercises for coordination, such as jumping and balancing. They are also taught the beginnings of lipreading which, for them, is the key to communication.

They have opportunity for individual and group play, in the nursery and outside in a fenced-in playground which affords safety from the regular play of pupils ranging through primary and teen-age levels.

Fruit-juice-and-wafer time is a welcome midmorning break. Lunch at 11:15 A.M. is followed by nap time at 12:00, until about 2:00. The indoor or outdoor play period, according to the weather, completes the full day by 3:00 P.M.

Progress Reports

Progress reports to parents are made three times a semester. At the end of semester a vocabulary list is given the parents, with columns in front of the words for lipreading, speech, hearing and reading. These columns are checked to indicate words in the child's four vocabularies. True, the lipreading column usually continues ahead of the speech column, and that above the column headed reading. The children do have word recognition of some words, such as names of objects familiar to them. These are words often used in their daily news. Children offer some bit of information interesting to them. The teacher prints about three short sentences on newspaper. The children enjoy identifying their names and the names of objects they have offered in their news. They "read" such words as ball, baby, or fish, and of course their own names.

Every morning the nursery pupils are examined by the school nurse to check on personal cleanliness and health. Conferences for each child are held at appointed times with the school doctor, parent, nurse, teacher, and principal. The doctor uses Wetzel's grid to record the height, weight and growth pattern of the child. This is used as a basis for comparison at the next checkup—usually annual, unless there is some specific condition that calls for earlier observation. The doctor gives the mother specific suggestions for diet, sleep and health. The school otologist also examines the ears and nasal pharynx minutely, studies the case history, gives the medical diagnosis and prognosis, and outlines medical or surgical treatment if needed. He suggests educational placement according to the degree of impairment of hearing.* An exact response to the individual audiometer test is not usually possible with nursery children of three and four. The teachers, therefore, observe carefully the response of these young children, if any, to gross sounds and vowel sounds. At A. G. Bell, which is the school in Cleveland for children who have no hearing for speech, the auditory stimulus must in almost every case be united with the visual and tactile.

Infrequently, as in the case of a young child recently, the otologist had us enroll a child who gave no response to the audiometer test and no evidence of having heard speech. It developed, over less than a year, that Willie could talk in sentences when the spirit moved him, especially when he was brought to the office as a discipline case and tried to alibi his way out. He has been transferred to a low mental class, for his difficulty was not auditory but mental.

Parent Education

Parent education, too, is an important factor in the nursery school program. Too often deaf babies have either been overprotected or have been rejected. The teachers, principal, the doctor, the otologist, the visiting psychologist and educators, who have been brought in, have tried to instruct the parents. They have tried to lead them in accepting their child's handicap objectively, to see him as a child to be dealt with on exactly the same basis as their other children, and to expect from him the same conformity to normal home living as the others, and the same rewards and punishments. How much harder they make the lot of their child when everyone bows to the whims and caprices of the handicapped one! How tragically unable

**Editor's note*: Dr. Charles E. Kinney, the school otologist, reports on the amount of residual hearing for speech rather than the hearing loss. This figure is obtained by using the "Rapid Calculator for Transposing Pure Tone Audiometry into Percentage Capacity to Hear Speech," developed and copyrighted by Dr. Kinney.

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to cope with life, such treatment makes him! On the other hand, the rejected child is perhaps even more to be pitied and helped. He responds to the affection and security afforded him in the definite program of the nursery school. A few specific examples of overprotection and rejection are these: Peggy, whose every whim was indulged at home, tried the same tactics in the nursery school. She snatched things from other pupils, pushed them away from their toys, and screamed if she was stopped in any act of wrongdoing. Firmly, but kindly, she was given short periods of isolation. She was a sociable child and gradually reformed so that she might be with her group. Rosemary, suddenly deafened entirely by meningitis before the age of three, was a desperately unhappy and frustrated child. Her temper tantrums, at first, were long and violent. She screamed, clawed her legs, rolled on the floor and bumped her head. She exhausted herself and her teachers in futile rage. Gradually attracted by the activities, she began to participate. Is she now a model pupil? By no means, but she has come far. Her tantrums are less violent and less frequent. Freddie was a product of a broken home. Father had deserted the young mother of three children. She was working nights in a dining car. The children lived in a series of rooming houses with casual oversight by the landlady. That child came to school, his face showing the rebellion and hurt of his sordid world. His response to firmness, but kindness, has been most gratifying.

Evaluating the Day School

Several years ago Dr. Helen Schick Lane set forth the main advantages of the day school and raised a number of points, still valid, which parents should investigate, about any day school under consideration for their deaf child: "In a day school the family life of the deaf child is not disrupted. The child can participate in all the activities of the home. He has greater freedom in the neighborhood and more opportunity for play with hearing children. Again, the parents should investigate. Is the day school large enough to permit good grading of classes or is the teacher faced with the problems of a one-room school? How large are the classes? Is the deaf child accepted by the hearing children in play or do they ridicule him? Do members of the family encourage the use of speech?"[1]

The Cleveland Program

Our Cleveland school has an enrolment of 131 pupils, and we have 57 pupils in hearing conservation centers located in schools for children with normal hearing. Our nursery has 28 children. These are divided into three groups: the new entries, the intermediates, and the advanced group. The new entries are in charge of two experienced teachers, one of whom is a special speech teacher; the intermediates also have an experienced teacher as well as the service from the building speech teacher. The advanced group teacher teaches speech to her own group.

The nursery children have their own fenced-in play spot, equipped with rocker boats, teeter-totters and slide. They are supervised in their play by a teacher and a physical education instructor. Since all other pupils have hearing impairments, as they have, there is none of the ridicule and cruelty of the hearing children toward them. The older pupils are sympathetic and helpful to the little ones.

As many parents bring their children to school and special conferences are arranged for, as well as observation periods, the parents are being constantly encouraged to talk to their children, to make use of the vocabulary taught in school, and to supply words that fit the daily activities of the child; but no matter what the school setup—residential or day, private or public—the nursery school has demonstrated that the formative years of the little deaf child's life must not be wasted. The precious opportunity to learn speech in the early years, as hearing children do, is a *must* for the success of the oral program. The social and emotional adjustment, too, in these early years, along with early lipreading and speech training, is helping to close the gap of retardation between the deaf and hearing child.

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[1]Lane, Helen S., "The Psychology of the Deaf Child." *Journal of Exceptional Children*, 16: 77-80, 96, December 1949.

Auditory Training - - Questions and Answers

FOLLOWING the presentation of a keynote address on the possibilities and limitations of auditory training at the 1954 Summer Meeting, in St. Louis, six members of a panel delivered papers on the subject. The keynote address and three of the panel papers were published in the October issue of the *Volta Review*. The remaining papers appear in this issue.

Dr. Leo G. Doerfler, director of the Department of Audiology of the Eye and Ear Hospital, Pittsburgh, and professor of audiology at the School of Medicine, University of Pittsburgh, served as moderator. Other panel members were: Ruth E. Bender, Louis M. DiCarlo, Lloyd A. Harrison, Audrey C. Hicks, J. C. Kelly, and Marian Quick. Dr. Robert Goldstein, research associate, Central Institute for the Deaf, read the paper by Mr. Harrison, who was unable to attend the meeting, and participated in the general discussion. Dr. Clarence V. Hudgins, the keynote speaker, also came to the platform to take part in the panel discussion.

DR. DOERFLER: I would like to start by asking Dr. DiCarlo what he means when he says a high fidelity group aid is a "little bit better" than a wearable hearing aid.

DR. DICARLO: I was talking about the beginning of auditory training for a young child, one to three years of age. So far as very young children are concerned, I would not advise starting auditory training with a hearing aid, but instead would recommend the mother's voice close to the child's ear. You will find that the identification of the mother's voice is a pleasurable experience. For preauditory training I prefer a high fidelity set which can provide compression amplification, to an individual hearing aid.

Compression Amplification

DR. DOERFLER: We hear a great deal about compressor devices for hearing aids. Are they just gadgets to raise the cost of the aids?

DR. GOLDSTEIN: I think compression amplification has definite advantages. Its purpose is not to encumber the hearing aid or to make it more expensive or profitable.

DR. HUDGINS: May I speak on that? I think you might find that the compressor device is only a device to limit or prevent the sharp notes of speech, or loud noises such as the dropping of books—thus protecting the child's ear from extra loud sounds. Another device for doing it is peak clipping. The methods differ and you get more distortion with one than with the other. I am quite convinced, and I think our teachers are, that the compressor device is very useful.

Tests for Lipreading Scores

DR. DOERFLER: What tests are used for preschool and school age children to obtain lipreading scores?

DR. HUDGINS: There is no standardized test. We wait until children are a little older before giving formal tests. I have used a standardized set of word lists (monosyllabic words) and also a film test developed by Dr. Heider several years ago. I have found a high correlation between the film test scores and those obtained from live voices reading the monosyllabic word lists. We feel that the test is difficult, but since the children are given the same kind of test year after year they all stand the same chance of getting good or poor scores. The scores are comparable from time to time and child to child. Those of you who attended the Summer Meeting in Boston may recall that Miss Quick described a multiple choice test which involved a slightly different method of scoring. The children responded to the test instead of writing down the word they saw or heard.

Amplification for the Very Young

QUESTION: Miss Bender described one or two children who wore individual aids—one as young as 11 months. I wonder if she would comment on the early use of individual hearing aids as compared with the early use of group high fidelity aids.

MISS BENDER: All of our little children are first given compression amplification

and are taught to listen. The very young one I described had consistently responded at a very low volume setting and was given an aid with such a light gain that he could not possibly have very high amplification.

DR. DOERFLER: I have seen Dr. DiCarlo work with an individual stethoscope-type of amplifier. I wonder if he would comment?

DR. DICARLO: The purpose of putting a hearing aid on a child is first of all to bring him up to the point of developing communication. He has to have a need. First he should have a pleasant listening experience with other human voices—his mother's voice when she speaks into his ear. You begin to give the child not only auditory response, but also feeling, and you begin your process of thought immediately. The child should get that in the beginning. He has to accept sound, in terms of wanting it —first the mother's voice and then your own, in a happy, laughing situation. Dr. Hudgins taught me that the best way to teach a child is to get him laughing, and then get the laughter into his ear. You can do a great deal with a stethoscope if you want to use it for a time. Let the child look it over, at least the first time he sees it, and show him how it works.

You must have a quiet room. After giving a child a pleasant listening experience with human voices, you can then use the table model aid with the type of amplification we have just discussed and give the child auditory stimulation. Then you can graduate the child to the individual hearing aid. If this procedure is not followed I feel that the child begins to use more and more amplification. We do not want children to get used to hearing with a great amount of power. We want them to use the minimum.

DR. GOLDSTEIN: I am not a teacher of the deaf and have never employed auditory training, yet like most inexperienced people I have definite ideas. I am critical of the use of live voice in a child's ear. Assuming that the child hears laughter, if he has a loss of 80 db or more can he tell the difference between laughing and crying if he does not see the face of the person who is laughing. Can he distinguish between the mother's voice and the father's? By using high fidelity amplification combined with lipreading, we get a combination of hearing and vision. Even in cases where the hearing is so poor that the child must rely upon vision, we still have his attention even though hearing or vision, or both, could work. I think we have to take into account why these methods work. We may be laboring under the misapprehension that by giving auditory training to a child, we are utilizing just his hearing. If we do that we are going to be working under false assumptions and wondering why some children, who have had auditory training, still cannot get along very well in the classrooms just by using the hearing aid. Both can be used very successfully. We have enthusiasm for the method but we should realize why it works, taking into account all of the factors and not just the hearing aid.

DR. DICARLO: I agree with everything Dr. Goldstein said, except that he misunderstood my point of view. You can communicate successfully when you direct your voice into the child's ear. You have him in a situation where you are not divorced from him; you have your hands on him; you make him aware that there is something more than the fact that you have put your hand on him. That is very important. What are the objects of an auditory training program? To make it complete, you develop synthesis. As the child becomes more sophisticated you develop a response in these skills. I know of no better way to develop alertness so that a child can change and acquire accuracy of response. Finally, you are developing concentration of attention. If you lie in bed for two years with your arm in a cast, your arm is going to be atrophied. The same thing is true with these children. If they do not use their hearing there is going to be a great lag in their performance, so I do not think Dr. Goldstein and I are in disagreement.

Amplification throughout the Day?

QUESTION: When do you have your children use their individual aids throughout the day?

DR. HUDGINS: For the most part our children use group aids when they are in the classroom. These aids are superior in fidelity and power output, and certainly the microphones are much more available to the teacher's voice. We would prefer that the children have the highest fidelity speech that we can offer and so we spend money

treating the rooms, putting rugs on the floors, and installing expensive high fidelity group aids. These are used throughout the day. They are turned on when the classes take up in the morning and are not switched off until the end of the school day. They are not even turned off at noon, as we have been advised that the tubes may last a little longer if they do not get hot and cold too often. We may allow individual wearable aids for practice, but for educational purposes we use the group aids. When school is over, those children who have individual aids wear them and most of them benefit by them.

Group vs. Individual Aids

DR. DOERFLER: Have you correlated PB scores using group amplifiers and individual aids?

DR. HUDGINS: Not at Clarke School, but during the war at Harvard we compared scores, working with deafened men, and as you may expect there was no comparison. A normal ear can understand speech that is very badly mutilated. Even deafened ears may get something from high, distorted speech. Nevertheless it is an unfortunate fact that the individual hearing aid has been built smaller and smaller to hide it further and further from the eyes of the world. In doing this the manufacturers have created a situation where it is absolutely impossible to build high fidelity acoustic signals in the aids. It simply cannot be done with these small aids. You get much higher fidelity and superior transmission from the large amplifiers.

Group Aid Use at Clarke School

QUESTION: For what purposes do you use group auditory training units at Clarke School?

DR. HUDGINS: We have 22 auditory training units in the 22 classrooms at Clarke School. They are used all day. There might be an hour or a class period devoted strictly to auditory training, but for the most part the aids are used as added teaching tools. They lengthen the arm of the teacher. They are used throughout the day for any subject being taught, and the children even plug in their phones at the blackboard so that they will not be off the air at any time during the class period.

Primary children, especially the younger ones, do not use group aids during the entire day. As they get older they use them more and more, and by the time they get to the upper grades they wear their instruments all day. If they change classes they carry their own earphones and plug in. If something goes wrong you will know it because they will burst in with "Can't hear! Can't hear!" To me that is evidence that they want the aids.

Aids for Psychological Reasons

QUESTION: Do you ever recommend the fitting of an individual hearing aid for older children, even if you feel the benefit may be mainly psychological?

DR. HUDGINS: We very definitely do. In many cases we find those children, who have had the benefit of group aids, writing their parents and having them ask me about the possibility of a wearable aid. In such cases we almost invariably recommend the fitting of a wearable aid. There are 140 children in our school, and I believe there are about 85 hearing aids on record. There may be a few others I have missed. Some of these are being worn, I might say, for psychological reasons, but these children are getting the benefit of a group aid throughout the school day and there is no reason why they should be cut off the rest of the time. We very heartily recommend a wearable aid and do for any child who asks for it.

Which Hearing Aid?

DR. DOERFLER: I would like to paraphrase three questions. I have heard the panel agree that there is a problem as to how you fit and select and decide which hearing aid a two- or three-year-old child should wear. Some people say "We send them to the clinic—to the center," and they do.

DR. DICARLO: I happen to have a number of used hearing aids that are practically new. We use them for this purpose. I do not ask the parent to buy any particular aid, but there is a tremendous problem involved. People who want to help these children loan aids to us for from two to six months, and then if there is enough improvement we are guided accordingly. We have about six or seven desk models which they can borrow. It is a serious ethical problem. I solve that by spending a little

of my own money to buy hearing aids and use them at the clinic. If the child returns, we go into a discussion and decide questions of convenience, amplification, frequency, operating cost, inital cost, etc. All of these things have to be considered. There can be no generalization.

DR. KELLY: We do not have too many young children, but we do have a few. When we find that the child has delayed speech, and hearing loss is indicated, we frequently suggest a hearing aid readiness period during which time the child is given some work with a commercial type amplifier. We believe that the trial period is worthwhile. Even for older children, for that matter, we use the trial period for several of these desk type battery powered aids which are given or loaned to the child until he is better able to adjust to an individual hearing aid.

MISS BENDER: When a child enters the nursery he is accepted simply as a child. As he becomes accustomed to our routine, he comes of his own accord because he has seen other children come and use the aids. He takes his turn; his attention is called to what the worker is doing with the little knob which switches off and on. It is only a short time until the very smallest children reach for the volume knob and turn it themselves until they set it at what presumably is their comfort level. They seem to like to experiment to see what it is like when it is louder or softer.

We keep a daily record of a child's volume setting and when consistency has been established—and it is amazing how soon this occurs—we feel that he is ready for training, his own ear piece, etc. Then we give him an aid on loan. We have a number of wearable aids of various types and kinds at our disposal, and experiment with the child in our own nursery. We discuss the aid with the parents, they take it home, and the child wears it there and his response is observed. At times we change the aid when it seems the child might respond better to another one. When we have established, by daily functional use with the child, some sort of pattern as to volume and frequency needs, and when all of us are satisfied, including the parents, as to the aid which is probably best for the child's present use, the parents buy such an aid. There is no time limit. We loan an aid until we feel able to make a definite choice. Of course the daily work with the amplifier goes on, accelerated by the wearable aid.

MISS HICKS: I would like to know what follow-up procedure is used for these children through the 8th grade. Are they kept in special classes, or what is done with them when they have finished their training?

MISS QUICK: Many children come to us through audiology departments and speech and hearing clinics, and through our own particular service at the University of Pittsburgh. There the children are put through an auditory training readiness program. Educational placement is made on the basis of the extent of hearing loss, when it occurred, parents' vocation, ability to respond, etc. Many come to our school in Pittsburgh; some before being fitted with hearing aids. Some come with reports that at the teacher's request, or at the time the teacher feels the child is ready or shows some response to auditory training, a hearing aid selection will be made at that department. Some of the other children go to public schools and receive special help.

Sound Pressure Level

DR. SILVERMAN: A recent study on the effects of industrial noise has demonstrated that continued exposure to a sound pressure level of 100 db tends to deteriorate the hearing. For people with severe losses such as those described today, who are wearing hearing aids and must get to a certain hearing level, the background is around 100 db sound pressure level, or 125 db sound pressure level for speech. Would any of the members of the panel care to comment on that?

DR. KELLY: I agree. We have had an opportunity to check tank corps veterans, both with speech impairments and hearing impairments. Our study has suggested the possibility that in some cases exposure to the noise level which is produced by a hearing aid may make it an instrument of damage. If you have no good reason for a binaural fitting, that risk should not be taken.

DR. HUDGINS: At Clarke School we have been quite cognizant of this matter and I have been a little concerned about it. There

(*See "Auditory Training," page* 417)

Religion for the Deaf Child

MRS. O. T. RICHARDSON

AS parents of a deaf child, my husband and I are striving to understand some of the many aspects of the handicap that our child will need to adjust to and learn to live with—happily, we hope, and as a productive citizen in a hearing world.

Jimmy, our deaf son, is seven years old. Our hearing son, David, is four. Perhaps my urge to write down a few of the religious experiences we have observed with Jimmy stems from the fact that one of our greatest difficulties in communicating with him is centered around the frustration we felt at first in dealing with abstract ideas—concepts that must grow out of awareness of other than practical things, things that can be felt, seen, smelled, acted out.

An outstanding public school teacher of the deaf gave me great comfort one day last summer, when she patted me on the shoulder and said: "My dear, don't accept all the generalities that you hear expressed about 'the deaf.' The surface has not even been scratched as to the possibilities that can be opened for your child and every other deaf child, if you refuse to sit back and accept past educational achievement as the ultimate goal for these youngsters!"

That statement from an experienced and respected person with no false illusions as to the depth of the handicap has many times since given me the courage to play around with "ideas" in introducing my son to the world around him.

Which brings me to the subject of giving a deaf child a proper feeling of his worth in society. According to my own thinking, there is a divine plan that guides the destinies of each of us, and unless this feeling of spiritual worth can be transmitted to our children, the handicap of deafness goes far beyond the loss of an auditory nerve. Some churches, for example the Catholic Church, have planned programs for their deaf children which are a real help to parents. Those of us who are not Catholics, and whose churches have no planned programs, have a greater responsibility than other parents and it cannot be met simply by transferring it to the schools. The schools can help, but they cannot shoulder all of the load. I know that all schools for the deaf, both day and residential, make some provision for religious training. In the residential schools, especially, leaders of all three religious faiths, Protestant, Catholic, and Jewish, come regularly to the schools to instruct the children. Nevertheless the home has its own responsibility in this matter. A number of parents have asked us what we are doing about spiritual training, and of course our answers must come with great humility, because we are at the beginning of the road.

Developing a "Spiritual Feeling"

However, I am going to sketch crudely what we have tried to do for our two sons to develop the beginning of a "spiritual feeling" on the part of the children. Jimmy lost his hearing, dramatically and profoundly, at the age of two. He had had no Sunday School experience, and we had observed no prayer ritual at bedtime or meals. A thoughtful friend, sensing our needs more than Jimmy's, I think, suggested that we bring him to our church nursery class where he would be with other children from two to four years old. She thought he could enjoy the social experience of being with children his own age, and the lessons were simple picture stories of children "sharing toys," "taking turns," "being thoughtful of others," etc. None of the Bible stories or terminology were included in the stories.

My friend directed the group, and I acted as one of the assistant teachers. This gave me an opportunity to learn children's names, get a picture of activities, songs, etc., that could be used with Jimmy during the week after I had adapted them and elaborated them according to his need. This

Mrs. Richardson, a resident of St. Louis, Missouri, has approached a subject of great interest to parents of deaf children. She is president of the P.T.A. at the Central Institute for the Deaf.

experience increased my appreciation of children's growth and development.

Jimmy enjoyed Sunday School tremendously, and was an active participant, not only in the games, but in "singing." The two years that he belonged with this group were happy for us, for, although he was only a little conformist, his ability to participate indicated growth and we knew that one day of the week had become *different.* It was associated with being clean, dressed up, participating in something with mother and daddy, playing in a friendly way with other children.

Evening Prayers

By the time he was five, he graduated to a new group, and I remained in the nursery with my younger child who seemed to need my presence at that time more than Jimmy did. Wishing to give David a background of understanding for Sunday School, I sat down impulsively one evening last fall to pave the way for a bedtime prayer. David was on my lap and Jimmy was sitting on the bed facing me as I groped for a starting point. *Moon, stars, sun, water, fish, animals, food, husband and wife, babies,* were all words well within the scope of Jimmy's lipreading and mental comprehension, and Dave could enjoy the same terms because of their simplicity.

I started with our usual, "Long, long ago . . ." and enlarged upon it by saying that, before mamma and daddy were babies, yes, long before even our granddads and grandmas were babies, there was just God. The children had to accept that word as it stood in the story. There was no sun, no moon, no boys or girls. Then God, who is very good and very wise, made the world. We have a map of the world on one of our bedroom walls, so that helped with "world." After a long time, God made the stars, the moon, the water, the trees—all the familiar landscape thrown in. Then he made birds, fish, animals, and finally a man. But the man was alone; there were no boys or girls and he had no one to play with, to work with, to love. So God made a woman, his wife. They were like mommie and daddy, and after a while they had two boys. They grew big, and had farms and sheep, and built homes for themselves and worked and played and everybody was happy. The pretty things grew, there was food to eat—realistic version. All of these things came from God, the rain to make things grow, the sunshine, the food, the healthy boys; and the people remembered to say "Thank you, God, for these fine things."

God is very good to us, to mommie and daddy. We have two fine boys, a pretty home (here I went into the details of our personal living) and when I was little and daddy was little, our mothers—your grandmas—taught us to kneel down and say, "Thank you, God, for all these good things."

It was at this point that I became speechless, for my two boys had slipped down to the floor and David expressed the wish, "Mommie, can Jimmy and I say prayers the same way you did?" It was as easy as that! Jimmy has many phrases of which he knows the meaning, although he cannot say them intelligibly. He interspersed his prayers with the latest language principle he had been drilling on at school, things other children had said to him, and words he actually knew; nevertheless, they were prayers, and we quickly established the habit. We also had prayers at mealtime, mentioning the names of food, our names, and our health. The boys themselves chose what they wished to mention in their prayers, and I think the habit, thus established, may be a background for more thoughtful reflection by and by.

This long story is not meant to stress sectarian feelings or express the idea that the outward expressions of faith are our goals. We hope it is just the beginning of an understanding and respect for the varying methods of showing belief in a Deity and a purpose in living the best life we can.

Bible Stories Are Popular

Our little stories drawn from the Bible have become as popular as any of the current Golden Books. We bought a little cardboard book before Christmas, and Daddy worked diligently with the boys to cut out the various pieces that fit into the Nativity scene. We would take them apart and dramatize the stories flannelgraph fashion —Mary and Joseph and the donkey coming to the inn, for instance—and I am beginning to think there is as much glow around

the story as for the commercially stressed Santa Claus. We had some of the usual confusion when Jimmy said, "I know—Baby Jesus—Santa Claus," but every child goes through that, too.

Easter also meant something besides the Easter bunny, and has developed a very comforting aspect in that both boys have had a real experience with the death of a friend, and the story of Jesus has figured in their speculations and reassurance that death is not final.

We are now dealing with some of the little stories so familiar to the average child: Noah and the Ark, the story of the Loaves and Fishes, etc. I know I rush in where theologians would fear to tread, but I keep hoping it is just the beginning of my children's interest and inquiry. At Christmas we wondered whether it was foolish to have Jimmy participate in the program, as it was made up largely of singing. Happily, we did, and he enjoyed the marching and the costumes. He even stood in the front row, mouthing the words very carefully at the teacher's direction. No one except the children in his group were aware of his handicap, and he had his full part in the Christmas play. More than one parent has told us that he is definitely an inspiration to their hearing sons and daughters.

At the moment, Jimmy's church school activities do not appeal to him so much as they did when he was younger. He is in a very large class and does not know the other children, and I am not able to "brief" him in the same way nowadays. Language is coming at him faster than he can learn it and absorb it; but he still participates in group activities, enjoys the visual aids, and knows where such words as Jesus, God, prayer, the Bible, and the names of individuals in the stories fit into the pictures. His teachers say that he pays greater attention than many of the six- and seven- and eight-year-olds in the group, and seems to get as much as they do from the lessons, if not more. If he develops an active distaste for attendance at Sunday School, we shall not insist on his going. Thus far, both children enjoy both Sunday School and the first half of the church service, and we may stop there for some time before going on to further teaching.

VOLTA BUREAU RECEIVES GIFT

Early in October the Volta Bureau received a most generous contribution from Dr. and Mrs. Gilbert Grosvenor. The check was delivered by their daughter, Mrs. Lilian Grosvenor Coville, when she came to Washington from her summer home in Baddeck, Nova Scotia.

Dr. and Mrs. Grosvenor's gift is further evidence of the Bell family's continuing interest in the work of the Volta Bureau and the Alexander Graham Bell Association for the Deaf. Mrs. Grosvenor, a daughter of Alexander Graham Bell, is a member of the Association's Honorary Board of Directors. Dr. Grosvenor, who recently retired as President of the National Geographic Society and as Editor of its magazine, serves as Honorary Vice President of the Association. Mrs. Coville holds the office of First Vice President and is active in Association work.

OUT OF PRINT BOOK NEEDED!

Many teachers have written the Volta Bureau about their need for *Steps in Language Development for the Deaf*, by Bessie Pugh. Letters to several individuals and schools have failed to produce a copy of the book which is now out of print. The Volta Bureau's library copy is also missing. The Bureau is willing to have the book reprinted but must first obtain a copy in good condition (suitable for photographing). Anyone having a copy to lend for approximately two months is requested to write the Volta Bureau, 1537 35th St., N.W., Washington 7, D. C. Please write before mailing the book.

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writes James H. Galloway, Superintendent, Rochester School for the Deaf, Rochester, New York.

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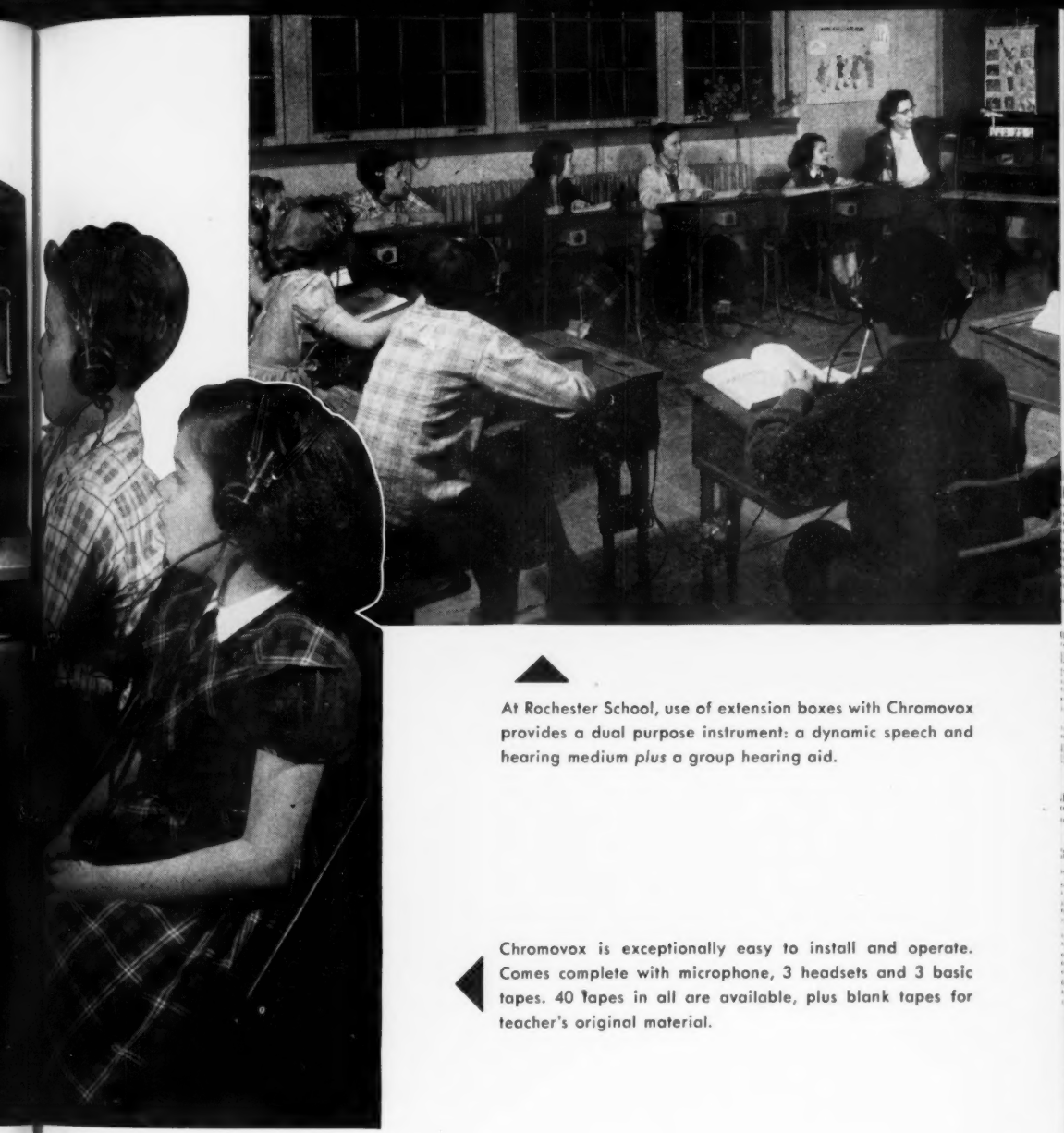

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The Program in the Houston Independent School District

AUDREY C. HICKS
Supervisor, Deaf and Hard of Hearing Classes, Houston, Texas

PROPERLY fitted hearing aids can benefit all children who have residual hearing, but in varying degrees. For this discussion I have grouped these children as follows:

(1) Those children who receive the least benefit from amplification are the ones who can learn only to tell when they hear and when they don't and who learn to discriminate gross sounds. The most that amplification can do for them, at least at present, is to supplement the use of lipreading and the sense of touch in developing accent and rhythm in speech. These children need powerful amplification and an individual aid is of doubtful value.

(2) The next group are those whose auditory training can go one step further. They can identify through hearing alone simple words and possibly simple sentences, as well as gross sounds. They can be fitted with hearing aids and can be helped materially to improve articulation and voice quality as well as accent and rhythm. It has been my experience, however, that these children *cannot* rely upon auditory stimulation alone for the development of speech and language, nor can they be placed in a class of hearing children with the assurance that their academic progress will be equal to that of their hearing contemporaries.

(3) The last group consists of those children who receive maximum benefit from auditory training and properly fitted hearing aids. With intensive help, covering a period of anywhere from one to five years, they are able to return to their regular classrooms for part or all of the school day. When they can consistently remain up to grade level by test, they no longer have need of special instruction.

There are always exceptions to this arbitrary classification, but the majority of children with hearing losses can be placed in one of those three groups.

The amount of time devoted to auditory training in the special classes for children with hearing losses in the Houston Independent School District varies as follows:

(1) The children who are classified as belonging in Groups One and Two are assigned to a full-time class for special instruction. They receive 30 minutes a day of pure auditory training on a group hearing aid. When they are able to recognize as many as six or seven words through hearing alone, they are referred to the Houston Speech and Hearing Center for the selection of a hearing aid. When an aid has been selected, they use it all day long, but because these children often come to school without the aid, for one reason or another, each of these special classrooms is being fitted with a group hearing aid. Further auditory stimulation is given throughout the day in combination with lipreading and the sense of touch for speech lessons and the development of language. This is done with all children in the class regardless of whether or not they use an individual aid and regardless of how they may have performed in the period devoted to auditory training alone. This has been ably demonstrated by various teachers at our morning sessions.

(2) The third group of children are placed in a school where special assistance is available for speech, language development and tutoring in school subjects. These are the children who can, in the beginning, attend regular classes for hearing children part of the day but who need additional help in order to reach maximum efficiency. Other factors being equal, they can eventually hold their own in a hearing class all day long.

The kind of auditory training given the children in our program again varies with their needs. Those in the first two groups learn first to tell when they hear and when

**Editor's Note*: The first three papers of this panel appeared in the October *Volta Review*.

they do not. This is followed by practice in discriminating gross sounds, using objects and records. Then practice in word recognition is given and after that recognition of sentences. We use the children's own speech and language for this work and may either introduce new vocabulary through auditory training or repeat words and sentences already learned. Since the children in the third group already have normal or at least intelligible speech and a command of language comparable to a hearing child the same age, they can be fitted with hearing aids without basic training.

Our goals with all children who have hearing losses are first, to give them communication skills which consist of speech, lipreading, reading and writing, and second, to help them attain maximum efficiency academically. We use auditory training as a means of reaching these goals and not as a method of teaching per se. Therefore, in making the initial decision regarding placement, we do not rely upon hearing tests alone. Each child is studied individually, and the fact that he can identify words well enough to be fitted with a hearing aid does not mean that he will be able to manage in a class of 30 or more normally hearing and speaking children under the guidance of a teacher who has neither the time nor skill to help him consistently with his individual problems. Included in such individual studies are health records, hearing evaluations, mental tests, achievement tests, subjective reports from classroom teachers, a personal interview, and any other information available. Some children need only lipreading or a combined program of lipreading and speech correction; others can use hearing aids and special tutoring to supplement their regular school work. For some, no amount of auditory training alone will meet their needs, and for these children the so-called traditional method is the only one that will do the job. No child should be denied auditory stimulation simply because he is apparently deaf, but I feel strongly that we need to regain our perspective with regard to auditory training and use it in relation to the individual child's total needs.

Auditory Training—A Panel Discussion

The Older Hard of Hearing Child

J. C. KELLY, PH.D.
Associate Professor of Speech, University of Illinois, Urbana

WHAT do you understand to be the meaning of benefit from a hearing aid?

The meaning of benefit from a hearing aid is made obscure by three popular misconceptions concerning the function of an aid. Since these misconceptions are responsible for much of the apathy our clients show for aural rehabilitation procedures, it is well to begin this discussion negatively by stating what the benefit of a hearing aid is *not*. The misconceptions are these:

Some Misconceptions

(A) *That a hearing aid will provide normal hearing.* The names given to hearing aids frequently give the impression that normal hearing may be achieved merely by putting on a hearing aid. The advertisements also imply that the hearing handicapped person may regain normal hearing as soon as he receives his aid. Yet in over 500 hearing aid evaluations at the University of Illinois, I have no recollection of a single instance where normal hearing has been achieved in a measured situation. In one sample of 32 persons, diagnosed as having predominantly conductive or perceptive losses by the referring physician, the mean word intelligibility threshold level for 15 conductive losses aided (best aid on better ear) was 11 db poorer than normal, and for 17 perceptive losses the mean threshold level was 16 db poorer than normal. The speech reception

scores were 5 per cent poorer than normal for the conductive losses and 16 per cent poorer than normal for the perceptive losses. The response characteristics of hearing aids suggest that normal hearing with one is unlikely. It is difficult to say that a hearing aid could provide normal hearing for anybody.

(B) *That a hearing aid will provide equal benefit for all persons with hearing impairment.* Many hearing aids are acquired after the prospective user or a parent observes that a friend has successfully used a hearing aid. Naturally he expects that the same success can be gained for himself or his child in exactly the same way. Unfortunately this same way may omit training procedures and, more unfortunately, the successful use may be more hopeful than actual. Successful hearing aid use comes easier for some than for others. It is generally acknowledged that nerve loss responds less well to amplification than conductive loss. In the sample mentioned above the mean aided score for the conduction losses was 91 per cent, while the mean aided score for perceptive losses was only 80 per cent. Considerably more attention needs to be given to the 80 per cent listener than to the 91 per cent listener. In this same class is the mild hearing loss, real enough in the audiogram but not improved through the use of a hearing aid alone.

(C) *That the benefit from a hearing aid is realized immediately.* This may be our greatest barrier to effective aural rehabilitation. The belief is due, at least in part, to procedures used by professional workers in the hearing area. Most hearing aids are selected on the basis of threshold measures, usually pure frequency threshold measures. The threshold measure assumes the optimum value immediately, for they are static measures. The thresholds on which selection is based will be no better in December 1954 than in June 1954. Pure frequency and speech thresholds are not known to improve with training, nor do they reflect any advantage of training. When the selection of hearing aids is derived from static audiometry, it may be assumed that the total benefit as shown by the measurement is available immediately. The need for auditory training following the acquiring of a hearing aid can be pointed up by a type of audiometry that will reflect the improvement in listening ability following instruction. It may then be demonstrated to the hearing aid user that the benefit of a hearing aid is a growing thing, reflecting the advantages of education. The supra-threshold speech intelligibility test is not a static measure and will indicate the changes in listening that result from auditory training.

The Positive Approach

The positive approach to the question must be: A hearing aid is a device to facilitate communication by voice by increasing the intensity and in some instances the clearness of the voice signal. It may or may not actually improve communication by voice, depending upon how it is handled by the individual user. The hearing aid provides only the means by which better communication may ultimately be achieved.

How much time in an educational program for hard of hearing children should be devoted to auditory training and what type of auditory training?

This question can best be answered in terms of a particular educational program, and the one with which I am most familiar is the Summer Residential Center sponsored by the Division of Services for Crippled Children, University of Illinois. This center is a six-week residential program with five hours of instruction five days per week. The time allotment for activities in which auditory training is stressed is two-thirds of the total program time. However, only 12 per cent of the time, one 40-minute period daily, is devoted exclusively to auditory training. In other activities no separation is made between the identification of auditory and visual cues to voice communication.

The type of auditory training is another matter. There are three aspects of auditory training that may receive practical consideration:

(A) *Familiarization with the hearing aid to achieve optimum workability.* The client should know his instrument. This knowledge should include battery care, management of gain control, and management of the tone control. One of our clients

reduced his listening score from 80 per cent to 48 per cent by the juggling of tone control switches; his threshold loss by this poor arrangement was 14 db. The user should understand the problems in addition to being given directions, else he may experiment with his aid to his disadvantage.

(B) *Adaptation to amplified sound.* Many of the ills of hearing aid use are temporary if the user has adequate patience and understanding. Negative adaptation to the noninformation bearing sounds can be accomplished with most persons, and will reduce the annoyance that is responsible for many hearing aid failures.

(C) *Recognition and discrimination of a substandard signal.* This is the most important aspect of auditory training. We believe that recognition of a poor signal can be greatly improved through patience; discrimination practice permits better identification of the signs present in voice communication whether these signs be audible or visible or both. It is very difficult to explain the mechanics of auditory perception because we have only a vague knowledge of the mechanics of memory, attention and discrimination. But we are able to demonstrate the improvement in performance in skills of recognition of voice communication. The question is not usually whether auditory discrimination practice is useful, but whether Device A is better to accomplish the purpose than Device B.

The structure to promote these skills above is difficult to discuss in a short period for there are so many possible devices. I will speak of three that we use in the Summer Residential Center.

Basic auditory discrimination is practiced using the talker-listener drill. Students are paired in teams of two and the messages transmitted check on the listener discrimination through the writing of the transmitted message. The scoring of each transmission provides motivation and forces keen listening. The materials for discrimination are numbers, letters, and simple words in series but out of context.

Two other devices may be briefly mentioned. One-half of the daily program is spent with organizations that we call theater therapy and music therapy. Both appear to be recreational activities. For instance, in theater therapy the children appear to have as their goal the production of several one-act plays at the end of the session. Line rehearsals are held daily. These line rehearsals present a structured conversation with familiar dialogue to make communication easier. To come in on cue the trainee must follow the dialogue with both ears and eyes in order to speak his own lines. The set line also provides the clinician with an opportunity to work on speech as well. The selection of the plays used is based on the conversational quality of the lines, the shortness of the lines, and the movement of the conversation. We feel that this therapy is unusually effective in auditory training and lipreading as well.

The second device is music therapy. This program is directed toward ear training, too. The principal activity is choral singing. Such singing, in addition to being enjoyable, tends to make the listener critically aware of sound differences. Since the singing involves words, it is both a drill in word discrimination and sound discrimination. Other listening activities include the use of informal instruments, solo and in groups, and a study of popular music. The stress in this program is not so much on the blowing or rhythmic activity as the discrimination of pitch and quality. The practice is aimed more directly at the ear than at the muscle.

Since these three devices for auditory training cannot be well discussed in the time allotted, I will merely mention them and invite later discussion.

WHY THE NAME "VOLTA" BUREAU?

Many times members of the staff are asked where the Volta Bureau got its name. One of the honors awarded to Alexander Graham Bell was the Volta Prize, established by Napoleon Bonaparte in honor of Count Alessandro Volta, Italian physicist from whose name we got the common words "volt" and "voltage." Dr. Bell invested the prize money (approximately $10,000) in other inventions and the subsequent income enabled him to realize his dream of an information center on deafness—The Volta Bureau.

Auditory Training—A Panel Discussion

A Program of Training for Young Deaf Children

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ANY discussion of research dealing with the response of profoundly deaf children to amplified sound provokes a number of questions on auditory training methods. These questions are especially pertinent in reference to mounting evidence of the ways in which older children profit from the extended use of the best type of modern hearing aids. In 1948, for instance, Hudgins[3] showed that one outcome of effective acoustic training may be measured by greater understanding or greater speech perception when the student is able to combine lipreading and hearing in his interpretation of highly amplified speech. In a succeeding study Numbers and Hudgins[5] reported that this increased speech perception occurs regardless of the pupil's ability to understand even highly amplified speech by ear alone. In a summary of more recent findings, Hudgins[4] indicates that these listening skills, once they are established, will continue to be of value to those who wear individual hearing aids. The general acknowledgment of such advantages can be seen in a steady increase in the number of group hearing aids and individual hearing aids used in schools for the deaf today. As a result, teachers are faced with a considerable challenge in developing the most practical methods of auditory training to help young children achieve these benefits early in their education.

In this respect, the methods suggested by such pioneers as the Ewings[1] in England and Guilder and Hopkins[2] in America have been modified and employed with success to teach the young deaf child to demonstrate his ability to hear. This widely used type of training teaches the child to use his hearing to recognize, discriminate and respond to gross sounds, music, and speech differing both in pitch and intensity. Briefly described, the procedure includes the presentation of a variety of experiences to increase the pupil's awareness of those sounds that he is capable of hearing. Following this period of stimulation the child learns to give a visible signal to demonstrate that he recognizes the presence of sound. Eventually he can be taught to discriminate between sounds by locating or indicating the source of the one presented. Used in a number of ways these techniques certainly fulfill their designed purpose of establishing auditory readiness for young children.

During this period of auditory readiness the teacher can form a rough estimate of the child's ability to hear. It may even be possible to obtain a more accurate measure of his hearing by means of a pure tone audiometric test. Presumably then, the next step in auditory training would be to teach a maximum use of the available hearing. This shift from measuring hearing to measuring the use of hearing puts the teacher at a considerable disadvantage. To determine whether or not the young child recognizes a given sound is relatively easy. But it is difficult to estimate how much he is using those sounds he is capable of hearing. Nevertheless the teacher may proceed with auditory training methods on the basis of benefits achieved by older children. She may aim her teaching to benefit that group of profoundly deaf children who use their hearing to supplement vision and thereby gain an increased understanding of speech, even in the absence of ability to understand speech by ear alone. In choosing a method to promote a supplemental use of hearing in the interpretation of speech, the teacher has a number of alternatives. She may discontinue specific auditory training and assume that the child will develop the use of his maximum ability naturally as a consequence of the continued use of a hearing aid in his education. She may simply vary the use of the readiness exercises to provide practice in the established listening habits. Or she may vary and extend the procedure of existing methods to include training in additional skills. Let us presume that a variation and extension of

training to introduce new skills is the most realistic choice we can make.

When we consider the initial auditory training procedures of recognition and discrimination, we may speculate on the introduction of a number of more complex skills. For instance, during the period when the child is learning to recognize sound he is taught to give a movement signal as an affirmative response. We might increase the skill requirements here by encouraging the child to duplicate the sound stimulus. In this way he can extend his sound experience through a less stereotyped response. He can indicate his recognition of a single sound or a series. He can show his awareness of such factors as duration and rhythm. During this same period we can teach the child to indicate a lack of sound recognition. The acceptance by the teacher of a negative response even this early in the training shifts the premium of teacher approval from ability to hear, to ability to use hearing. We may also provide for additional types of discrimination practice. In his initial period of auditory training the child may learn to demonstrate his ability to discriminate one sound from another by choosing the correct source from a number of known possible sources. More advanced training may be extended to include the discrimination of a known sound when it is presented in a series with unknown sounds or the recognition of a single given sound in a series of familiar sounds. An even finer discrimination is required when a sound is presented with a background of noise.

While we may extend these same procedures ever more widely to include experiences with sounds of varying frequency and intensity, we cannot be sure on the basis of this training alone that we are teaching the child to use his hearing as a supplement to lipreading in his understanding of speech. For in describing these variations in procedure we have considered only that training that teaches the child to use his ability to isolate or select a recognized sound in the absence of visual clues, while the response we hope to attain requires an integration of recognized auditory cues with vision to aid in greater understanding.

The training recommended[1, 2, 4] to teach this skill of integrating vision and hearing consists of an early use of a total sensory response to learning experiences. This approach means that the teacher constantly presents the communication skills of speech and lipreading so that the child combines the use of his sight, touch and hearing in learning situations. We may also extend this work to include emphasis on specific phases of the integration process. For instance, we may provide training which will teach the pupil to complete a learned sequence on the basis of recognizing a unit in the sequence. We may aim for a better use of context clues by teaching him to accept an unlearned part of a learning experience as a consequence of its combination with a learned part. Of course, the teacher can only guess how much the young child uses his hearing to supplement lipreading in his understanding of speech. She cannot use the objective tests available to measure the young child's use of hearing since they require a skill in writing and reading far beyond his level. But she may roughly estimate his reaction by comparing his response to learned material presented first through lipreading, and then through hearing, and finally through a combination of the two.

In summary, it may be said that while we may not find objective ways to measure the benefits of auditory training as it applies to the young child's ability to use his hearing, we may assume that the ability is available for training and that this training should focus on every imaginable skill contributing to the understanding of speech.

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On Nasality

FROM THE UNPUBLISHED WRITINGS OF JOHN DUTTON WRIGHT, 1866-1952

IN the effort to reduce a tendency to nasality and to increase the clarity of vowel sounds, two procedures are helpful.

The first is to develop in the pupil a recognition of the feeling of vibration in the nose, and a *desire* to eliminate it in *all sounds except three*: The "m," "n" and "ng" sounds.

The Cause of Nasal Vibration

The nasal vibration comes from a relaxed and too pendant soft palate. The normal position of the soft palate during speech—except when uttering "m," "n" or "ng"—is retracted and raised with decided concavity facing the front of the mouth. This position of the soft palate prevents sound from passing up and out through the nose and deflects the breath stream as it rises from the larynx, turning it almost at right angles and directing it toward the mouth opening. For the stop consonants, voiced and unvoiced, this retracted and backward position is sufficient wholly to block the passage of breath and sound out through the nose.

If the muscles of the soft palate are not sufficiently strong to hold the palate up and concave most of the time during speech (the convexity being toward the back wall of the pharynx), then the palate hangs more or less limp and leaves a passage for breath and sound to pass up into the nose and out through the nostrils. It is this flabby and relaxed state of the palate that spoils the clearness of vowel sounds and adds a nasal quality to speech.

The second procedure is to give the palate muscular exercises to strengthen it and enable it to stay rather tense, well raised and retracted for long periods, and to move rapidly and sharply when, by the arrival of an "m," "n" or "ng" sound, the palate must momentarily relax and open the nasal passage, instantly snapping back to its normally raised and concavely retracted position for all other sounds. This rapid and accurate movement of the palate and its ability to *remain* slightly hard and well up and back for *considerable periods* is essential to good speech. If the palate has not learned to do this, it must be both taught to do so *and must be given the muscular power to do it.* This muscular power can be given the palate by suitable exercises, just as it can be given to fingers, arms or legs by suitable exercises.

A trained teacher of speech knows precisely what the soft palate is (or should be) doing as each sound is uttered. The teacher knows, for example, that in uttering the word "pomp" the thought of making the "p" automatically causes the soft palate to snap back and up and completely close the passage to the nostrils, while the shut lips close the passage outward through the mouth. While the "p" is being made both front and back doors are completely closed, and it is the soft palate that shuts the back door when "p" is uttered. But both doors are kept shut only an instant for the lips part at once *while the palate remains retracted with its convex side held toward the back wall of the pharynx so the breath stream is reflected and directed toward the lips and the vocal cords come into action to produce the sound of the vowel.* The moment the vowel has been uttered the palate relaxes and falls slightly, allowing the breath and sound to enter the nose through the back door, while the lips close again to shut the front door. *But the palate should not fall so far, and be so greatly relaxed, as to allow all the breath and sound to go out through the nose. It should remain sufficiently retracted to permit a good share of the air and sound to pass toward the lips, thus causing strong*

Editor's Note: This paper is published by permission of Miss Matie Winston, principal of the Wright Oral School, which was founded by Mr. Wright in 1894. The author's distinguished list of contributions to the professional literature on the teaching of speech and the education of the deaf are well known. During his career Mr. Wright was a frequent contributor to the *Volta Review* and it is a privilege to present his article "On Nasality," previously unpublished.

lip vibration in uttering "m." Frequently the pupil's palate relaxes so much that there is very little vibration felt on the lips in uttering "m." If that is the habitual way in which the pupil has been making an "m," and if at the teacher's request he does manage for a moment to get good strong vibration in his lips when making an "m," the chances are he will feel his lips *itch* and will bite them or rub them with his finger. This is because the lips are not accustomed to normal vibration in "m" and are sensitive and feel "funny" when they suddenly vibrate properly. It is the flabby and relaxed palate that spoils the clean, resonant "m" by shutting off much of the breath and vibration that should be set up in the front of the mouth as well as in the nose in uttering "m."

But the poor palate should not be allowed more than an instant of relaxation before it must snap back and completely shut the back door, while the lips, shut already, remain shut to close the front door for the second "p" of the word "pomp." Just in the utterance of that one word the palate has had to jump around at a lively rate. Therefore the uttering of a rapid series of "pomp pomp pomp pomp, etc.," would be an exercise to strengthen the palatal muscles and train the palate to rapid and accurate movements.

If, instead of saying "pomp," the pupil had said "pop pop pop," the palate would not have had to move so much. In fact it *should* have remained almost entirely still for no breath or sound should have escaped through to the back door even with the front door open momentarily for the vowel. So exercises beginning and ending with a stop consonant, with just a vowel between, form excellent exercises in holding the palate retracted and rather tense for a long period of time. If an "n," "m" or "ng" is added to the word between the first and second stop consonants, then the palate has to get busy and move rapidly. For example "tint tint tint bank bank bank bump bump bump pump pump pump sink sink sink, etc."

The trained teacher of speech will have no difficulty in arranging any number of exercises that will tend to strengthen the muscles controlling the soft palate, and train it to move rapidly and positively and to remain somewhat tense and retracted and concave for considerable periods without tiring.

The "closer" the vowel sound that is used, the harder it will be to direct the breath and sound *all* out through the mouth and have no leakage up into the nose, because in a "close" vowel such as "e" (as in see), the mouth opening is so narrow that it requires more pressure to force the breath and sound out through the mouth and so brings more strain upon the palate in its effort to close the nasal door. In the exercise "peep peep peep" there is likely to be more vibration felt in the nose than in the exercise "pop pop pop," where the mouth opening is larger and not so much strain is put upon the soft palate in its effort to divert the breath and sound from the nose.

What has been said should be enough to direct the teacher's thought to why there is nasality and what can be done to reduce it.

One can become conscious of the movement of the soft palate by saying a prolonged "m————" and, while *the lips are kept shut*, thinking of the sound "p" but not allowing the pressure to be relieved through the lips but letting the air out through the nose while the lips are still shut. By repeating this and trying to feel what goes on in the back of the mouth, it is possible to recognize the sudden tightening of the palate and its retraction to shut the back door for the "p" position—"m————p," and in a moment letting the air out through the nose *without having opened the lips.*

In looking into the open mouth at the soft palate the pupil can see the palate and the little pendant uvula, and by inhaling through the open mouth he will see the palate rise and go backward. The *thinking* of a yawn, if the pupil can manage that, will also pull the soft palate up and back. It is possible to learn to raise and lower the palate at will while the mouth is open and the movement of the palate is visible.

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The Parents Talk It Over

With Harriet Montague

Touring with a Deaf Child

Patrick is two and a half years old. He has been profoundly deaf from birth.

My husband had to go to Ohio on business, so we figured it would be a golden opportunity for us to visit relatives in Illinois. We have had a station wagon for years, and have a mattress that just fits in the back of the car, so the three children can sleep very comfortably. We have always driven at night and therefore have not had to cope with the problem of keeping the children amused for hours at a time. But this trip was not so good. The weather caused part of our trouble. We traveled across Iowa paralleling a series of tornadoes and got the high winds, driving rain and lightning. Pat was so busy watching the lightning that he couldn't go to sleep. And then we had the toilet problem. Pat has been trained since he was a year old—at home he goes to the bathroom by himself. He did not like the strange toilets in gas stations, and refused to cooperate, so we had a problem all the way to Illinois. He wasn't fussy, just restless, but he did present difficulties.

On the positive side of the picture, I discovered some things that have given me a lot of encouragement. For instance, when I was dressing Pat one morning, I put his socks on him and told him to get his shoes, which were across the room. My mother was simply amazed that he knew what I wanted, without my pointing. He always gets me his shoes and I never thought anything about it. But it occurs to me now that a lot of the little things like that, which I have always taken for granted, really do show that Pat is getting along beautifully.

I notice that many of the people who write letters in the *Volta Review* say that they learn so much about raising children from their deaf children, that they wish it were their oldest child who was deaf, so they could have put what they learned from him to use in raising their other children. I cannot agree. I think that a lot of things Pat does are due to the fact that I just take it for granted he can do them because the older children did. I forget much of the time that Pat is deaf. I expect him to behave normally, and he does.

Adults Who Misunderstand Deafness

I wish I could say the same of adults. I thought that when we got to Illinois I would have the four-hour period, when Pat was taking his daily nap, to see my old friends and catch up on the smalltown gossip, etc. It didn't work out that way. My mother wouldn't let me out of the house. She said: "But what would I do with that baby if he woke up while you were gone?" I told her just to do what she'd have done with Suzi or Mike when they were that age; and that Pat wouldn't wake up anyhow. He never does. But she wouldn't hear of it. I can't understand why people, especially those so close to Pat, can't accept him as a perfectly normal child who simply cannot hear. We moved here to this neighborhood just short of two months ago, and I have a neighbor who has seen Pat several times a week since we moved here. She didn't even know that he was deaf until last week. She asked me why I stamped my foot when I was calling to him, and she was amazed when I told her that he could not hear. Now that she knows, she has stopped talking to him and has started making elaborate motions.

Pat plays out of doors all day now. He helps me weed the garden. He loves to play with Suzi's doll and buggy, and pushes the buggy around by the hour. I took all our home paraphernalia to school and we showed the teacher there some of the work we were doing at home. She was very much impressed with what Pat is able to do. Pat is scheduled to go to school half a day five days a week this year, instead of just several times a month as he did last year.

Preparing the Deaf Child for New Baby

We are going to have another baby in December, and I am not yet emotionally

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adjusted to the idea. I am afraid of having another one who is deaf. I know there is no reason why I should worry, but there was no definite reason why Pat was deaf, either.

I don't know how I am going to fit a baby into our present schedule, but it is just like the problem of feeding and clothing another child. You can always find enough money somehow to take care of your children, so I suppose I'll find the time, too. I am determined, however, that the time we spend on Pat won't be taken away from him. I am bothered about how to prepare him for a new baby. Suzi was terribly jealous of Mike when he was a baby, so when Pat was on the way I spent the entire time telling them how lucky they were to be having a baby all their own. They have always loved him and accepted him. Pat is inclined to be jealous of all of us. He doesn't want me to even notice other children, and he doesn't like to have Suzi and Mike play with other children unless they are doing something in which he can be included.

MRS. MCL., NEBRASKA

DEAR MRS. MCL:

Pat has already discovered for himself one way to get ready for the new baby. You say he likes to wheel Suzi's doll around in the buggy. Get him a baby doll of his own, preferably one that wets, and let him diaper it, wash it, feed it, and carry it around. It is nonsense to assume that girls have a monopoly of interest in dolls. The boys here at the Tracy Clinic are as much interested in taking the baby to walk as the girls are, and they love to iron doll clothes on the little ironing board and arrange and rearrange the playhouse furniture. They get a big thrill out of giving the baby doll a bottle and changing its diaper. If Pat has a baby of his own that he can take care of when you are taking care of your baby, he will not be so likely to be jealous.

Try to give him a share in the baby from the start. If you can possibly arrange it, let Pat come with your husband to the hospital when you and the baby go home. Let him see the baby first in the hospital and ride home with it in the car. This is much better than sending him to stay with friends or relatives during this period, and then

bringing him home to find a stranger installed and taking up a great deal of your time. If he has a share in the baby from the very beginning, he will accept it more easily as *his* baby.

Your neighbor who stopped talking to Pat as soon as she learned he was deaf is typical, even of some people who have had experience with the deaf. I know a superintendent of a school for the deaf who always refuses to talk to me, but insists on spelling to me, although I am very slow and uncertain about understanding finger spelling, and I do read lips.

Learning to Deal with Deafness

Carol is almost five years old. She became severely hard of hearing at the age of two. The extent of her deafness has not been determined.

We had discarded Carol's jigsaw puzzles for about a month, as she was gettting bored with them. One day last week I purposely placed one on her desk for her to discover. She worked it perfectly three times before losing interest, and then put her mind on a comic book. She enjoys looking at comic books and wants me to buy one every time we go to the super market. She holds her book until we get to the check stand, puts it into my basket until the clerk checks it, and then quickly claims her book again.

Another thing she has discovered is the gum machine. As soon as she sees the gum machine she begins begging for a penny by tugging at my purse. I let her have one penny each time we go to town. Usually I let her pick it out of a group of coins. I hold up one finger and say, "Just one penny," and she always picks the correct coin.

Last week, my parents took Carol to the train to meet my sister, who was coming home from New Jersey. She had been teaching school there and Carol had not seen her in months. I pasted a picture of a train and one of Aunt Joan on a small card, and gave it to Carol before she left. At the time she did not get the connection, but as soon as the train came in and passengers began to alight, mother showed her the picture again and she immediately understood.

The scrapbook is a big help in explaining things to her, and also in reminding

(*See "Parents Talk," page* 416)

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Book Notes and Reviews

Your Deafness Is Not You, by Grace E. Barstow Murphy. Harper & Brothers, New York, 1954. 238 pp. $3.

I am not much in favor of marking in books, and rarely underline favorite passages, yet I marked one passage in this book with an indelible pencil and wrote a lot of page numbers on the flyleaf indicating statements I wished to reread. The two sentences I underlined are on page 212: "Only those conquer the effect of deafness who are self-confident. The continual temptation to be self-conscious, and the constant battle against it, create self confidence by sheer contrast." The author is talking about deaf automobile drivers in a chapter entitled "Safest on the Road," but the statement could stand as a résumé of the content of this book.

Mrs. Murphy, the wife of the famous biologist and explorer, Robert Cushman Murphy, has experienced during her lifetime all the stages of deafness, beginning with partial loss of hearing in childhood and continuing through gradually increasing losses, mitigated by more and more powerful hearing aids, until, just a few years ago, all her hearing went. She no longer hears any sound except the noises in her own head. From her current viewpoint of total deafness, she casts her eye back over a long, full and satisfying life, and although she mentions from time to time the deprivations of deafness and the pain and discomfort they cause, she never fails to emphasize the compensations that accompany a straightforward attitude toward the handicap.

She has had an unusually interesting and complete life, has borne three children, watched ten grandchildren grow toward maturity, has traveled over most of the civilized and some of the uncivilized globe, from the Arctic Circle to the Antarctic, and has brought full measure of appreciation to everything she has seen and experienced. She has recorded her appreciation in several readable books.

Your Deafness Is Not You is a rambling, not always cohesive narrative, and there is a great deal of repetition, but the repetition has point. The author follows her self-imposed task of interpreting the hard of hearing to those who hear normally, while she emphasizes even more roundly to the hard of hearing themselves the fact that they still have a great deal left in life.

It is possible to trace in successive chapters the gradual strengthening and clarifying of the author's own attitude toward her deafness. I have an idea much of the first part was written from notes made long ago, and as she moves forward toward the present, Mrs. Murphy forgets her rebellion against the unkindness of the hearing and proceeds to read to the deaf a rousing good sermon on how to get along with their handicap.

Never at any time, throughout the book, does she use the word "affliction," and having a special aversion to that word as applied to deafness, I hereby award her an accolade for this fact alone. At the beginning she tries to explain some of the effects of deafness on the individual, but she soon forgets about them in her interest in pointing out the things she has left to enjoy. There is a chapter, entitled "Ingenuity Keeps Doors Open," that all of us need to read and take to heart. Her description of her method of telephoning is very like one written by Mrs. Lilian Grosvenor Coville concerning the method used by Mrs. Alexander Graham Bell. The section of this same chapter devoted to the theater found an echo in my own heart, for I have sometimes wondered if I were the only totally deaf person who refused to give up going to plays. Chapter 10, "Music Played On," is intensively interesting and aroused more emotion in one reader than any of the rest of the book.

In a work where so much is quotable, it is difficult to select passages, but I do like these statements:

"We have to walk a tightrope between too much aggressiveness on one side, and too much self-repression on the other."

"The habit of responsibility is a good thing for us deafened. There has been no one to whom I could relegate the job with my family, even had I wanted to do so.

Three generations needed me, and I carried them."

"The experience of being in a group counts—the feel, the mood, and the sight of what is going on . . . . There are instances almost every day that bring reward for the habit of going out among people."

At the start the author was impelled by the idea of educating the hearing world in regard to deafness; but gradually she forgot about this and concentrated on educating the deaf themselves. As a sensible and courageous woman she faces the fact that the hearing world will not adapt itself to the deaf; it is up to the deaf and hard of hearing to adapt themselves to the hearing world and to learn how to get along with it. We cannot make the world over. As Mrs. Murphy puts it: "All over the world there are many of us, and most of us learn to smile, most of us push the loss aside, knowing that in such a way lies our own salvation and also the fulfilled need of the human companionship of the unhandicapped. . . . And the world helps us most when we force ourselves forward with zest. We have to build according to the plan that is handed us, and not an imaginary one of wishful thinking."

All of us need to read this book and I, for one, extend to Mrs. Murphy a vote of thanks for writing it.—*Harriet Montague*

The Deaf and Their Problems, by Kenneth W. Hodgson, with a preface by Sir Richard Paget, Bart. New York: Philosophical Library, New York, 1954. 357 pages. $6.00.

As one picks up this book and is greeted by Sir Richard Paget, described by Hodgson as "the greatest living authority on human speech," the unmistakable first impression is that this volume will be a lucid espousal of the advantages of the "New Sign Language" in educating deaf children, especially for the early education of the young born-deaf by the "Mother Method." For the past 18 years Paget and his wife have worked at the construction of a systematic sign language "in which all the signs are, as far as possible, pantomimically related to their meaning, and in which all meanings which are related to one another are given similarly related gestures." He suggests that if the young deaf child is introduced to the sign language at the age of two, he should know about 2,000 words when he is four or five. Mr. Greenaway, headmaster of the school at Doncaster, has been sympathetic, but has added one important finishing touch, *i.e.*, adults who have care of young deaf children before they go to school should speak (orally) at the same time as they sign, so that the deaf children would get to know that their mentor's mouth-gestures meant the same as their hand-gestures. Mr. Greenaway urged that by so doing the young deaf children would develop their understanding of language side by side with their appreciation of normal speech.

The concluding argument of the preface will not come as a surprise: "The ideal would, of course, be that the parents or foster-parents should learn the sign language and introduce it into their home life. The deaf child and his hearing brother or sister could then communicate freely with one another, the hearing children using speech and signs together and encouraging the deaf child to do the same. There is a further possibility; namely, that the sign language might be taught as a form of play to all children, to develop their powers of observation and expression. If this were done in all countries by means of instructional films, there would be a very simple international language by which the different races of mankind, including the deaf, could understand one another."

Mr. Hodgson has done a good job of writing a survey of the history of the treatment and education of the deaf with particular emphasis upon England. It will serve a useful purpose, especially in centers for the training of teachers of the deaf, in courses designed to provide background information for prospective teachers.

The book is divided into three parts. The first part deals with (1) The Mechanism of Hearing; (2) How the Mechanism Works; (3) Ears and No Ears; The Emergence of Hearing; (4) When Things Go Wrong; and (5) Assessing the Damage. This section, included to make the historical account more intelligible to those not familiar with scientific particulars regarding the ear and hearing, is concisely done. It is difficult to imagine anyone reading these 55

pages and failing to get Mr. Hodgson's feeling for this "miracle of Nature's engineering." The wonder is that so many millions interpret sound so well.

Part II deals with the deaf, their treatment and education from ancient times through the nineteenth century—the discussion being organized chronologically. Part III treats the problems of the deaf in the twentieth century. The late chapters appraise the problem of deafness in England as it relates to: (1) The Schools; (2) The Teachers; (3) Parents and Children; (4) Primary School; (5) Secondary Education, and (6) The Adult Deaf. Regarding schools the author has this to say: "In deaf education the American experience is that the expensive way is, in the long run, the cheapest. If America cannot afford to waste the potential of her deaf, still less can we afford to allow possible graduates to come to nothing more than shoe-repairing. Traditionally, we prefer in education the way which looks cheapest, but is really the dearest, and that tradition militates strongly against any radical change." He concludes his chapter on teachers: "So long as we fail to publicize the problems of the deaf and our own work, so long will children suffer needlessly and the profession be held in scant regard."

The Deaf and Their Problems is being added to the library of the Teacher Education Department at Clarke School as a reference useful to the students in preparing their papers on the history of the education of the deaf.—*George T. Pratt.*

Parents Talk It Over

(*Continued from page* 413)

her of past experiences. We use pictures in all sorts of ways, and have charts pinned up around the house—in the bathroom, in the kitchen, and in Carol's room. We have one chart with pictures of "Things Mamma Does"—washing dishes, cleaning, making a cake, etc. Then we have a chart with pictures of Daddy's activities.

The article you sent on traffic education was very interesting. That is one situation that has always worried me, because Carol does not want to hold my hand when we walk down the street and pays little attention to traffic.

During the summer, Carol's class at school has been collecting farm pictures. Last Saturday they all came out to our place for a field trip, and Carol certainly enjoyed showing them around. She can be a proud hostess at times. I am trying to teach her to get along with other children. She loves to be included in a group but she is apt to push other children around and start a fight. Unless I am there to supervise, this sort of thing repeats itself. I hate to scold Carol every time she has playmates.—Mrs. A. Z., Washington

Dear Mrs. Z:

What a good mother you are, and what a good teacher! You understand how to help Carol and have the patience and persistence to do over and over the many little things that have to be repeated often in order to be learned. You are giving Carol a variety of experiences, and are providing lessons informally without making a task of them. Your collections of pictures are splendid, and I know Carol learns a great deal of language through pictures.

Carol's rough play is partly the result of frustration because of her deafness. She is not yet fully in communication with the other children, and she cannot join in all the things they do, so she tries to put herself forward by being aggressive and rough. This is something that is best worked at indirectly, through building up her self-confidence and her realization of her own ability. Give her constructive outlets for her energy; teach her to do different things well; teach her to rely on herself. Give her small jobs to do around the house and praise her when she completes them. Let her wipe dishes, set the table, help you hang up the clothes when you wash. This will slow up your own work, but will be very good for Carol. She will be far more generous and cooperative with other children if she is confident that she can hold her own with them.

I would not punish nor scold her when she strikes the children, nor try to explain anything to her at such times, except to interfere if she actually hurts another child. I would try—as you are doing—to supply her with legitimate outlets for her energy, to take the place of her destructive, aggressive habits.

Auditory Training

(*Continued from page* 396)

have been specific instances in which there may have appeared slight loss as a result of the use of the aids I have been discussing. The only information I have comes from measurements made over a period of seven years. There are about 25 of the older pupils who have been using great amplification for six to seven years. I had fairly satisfactory audiograms from them at the start of the program, and have made them each year—sometimes twice or three times. The data indicates essentially no change in the threshold level. The one exception is that of a girl who underwent a loss of approximately 7 or 8 db which appeared to be real. This was accompanied by an upper respiratory infection which, I think, probably accounted for the loss.

I think it is important to mention that in the cases of the children we have been discussing, with very severe hearing losses, there is not too much potential left to be damaged. With moderate hearing losses you do not need to get those high levels. When we have a loss of 40 db we give that person speech of 70 db; we are not exposing him to loud noises and the instruments we use are such that the wearer can control his own level in the compressor. Each child sets his own limit as he switches on his instrument.

DR. SILVERMAN: I am saying that the level may be too high because the child is using his comfort level as his criterion instead of his threshold. I feel that we should be aware of the level of his traumatic potential.

DR. HUDGINS: I agree that we should bear that in mind.

DR. DICARLO: When I first said that we want to get the child to hear, that is exactly what I had in mind. Our experience has been that in working with children 8 or 9 years of age, where amplification can be controlled, we find a continuous increase in the use of hearing. We find the degree to be steady. Some younger children have come back to us a year or two later and we find that their hearing has deteriorated. I do not know the reason, but the loss has been observed and we are taking account of it. I feel sure that what Dr. Silverman is saying is potentially correct.

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Teaching of Speech

(*Continued from page* 389)

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NEWS

New School Facilities in Portugal

New and modern facilities for the education of deaf children have recently been completed at the Institute de Jacob Rodrigues Pereira, Lisbon, Portugal. The school operates as a part of the *Casa Pia de Lisboa,* a governmental organization of public assistance. A recent bulletin concerning the school stated: "What we have accomplished in this experimental phase will be enlarged to a scale determined by the necessities of the country, as the conditions have been insured for the development of this center of studies as well as for the preparation of teachers. . . . Within a relatively short time, our country will benefit from a complete plan in regard to this type of education . . . so that it will be possible to rehabilitate all our deaf children. . . ." The new facilities include classrooms, many of which are equipped with group hearing aids, and special rooms for hearing testing, auditory training, rhythm training, training of breathing and correction of posture, and psychological testing. A library and teachers' rooms have also been provided, as well as a dining room, play areas, etc.

New School in Malaya

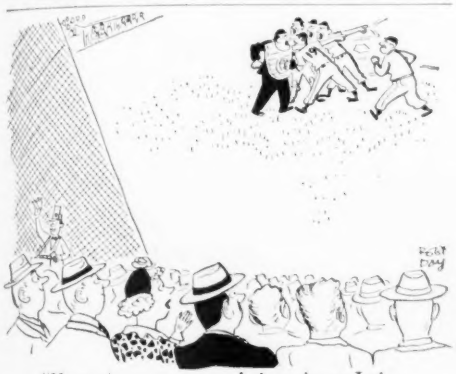
A new school for the deaf was opened on April 1, 1954, in Penang, Malaya, by Lady Templer. It is, at present, the only school in the Federation of Malaya and is operated as a residential school for Asian children. There are 24 pupils, with accommodations in the existing building for 60 pupils. Miss Joyce Hickes serves as principal.

Training Program for Parents

A training progarm for parents of hearing impaired children was opened on October 11 at the Institute of Logopedics, Wichita, Kansas. Lectures will be given on each Monday evening through December 13. Seven members of the Institute staff will deliver addresses, and lectures will also be given by a psychologist, a pediatrician and an otologist—all of Wichita. The last

NOTES

three sessions will be devoted to the nursery and preschool child, the deaf child in the first grade, and the deaf child in the more advanced grade. A demonstration will follow each of the last three addresses. Those interested in further information should write to the Institute of Logopedics, 2400 Jardine Drive, Wichita, Kans.



"Next time we must bring Aunt Lois. She can read lips."

(Reprinted from THIS WEEK Magazine. Copyright 1954 by the United Newspapers Magazine Corp.)

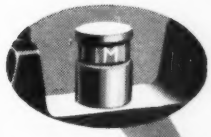
New Japanese Publication

The Volta Bureau has recently received an autographed copy of *New Lecture of Language Teaching to the Deaf*, by Professor U. Kawamoto, Tokyo, Japan. The 451-page book, written in Japanese, was published by the Japanese Association of School Principals for the Deaf in memory of Mr. Kawamoto's retirement as principal of the Japan National School for the Deaf. Mr. Kawamoto's book has been cataloged and placed in the John Hitz Memorial Library at the Volta Bureau.

Volta Bureau to Distribute Story Book and Record

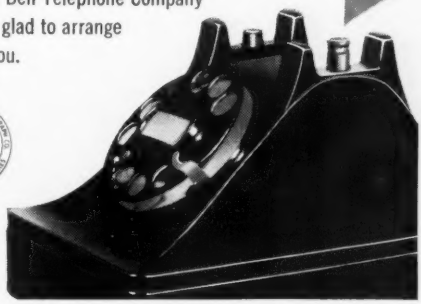
The Volta Bureau has been named the exclusive distributor for *My Favorite Three Bears*, written by Mrs. Mildred Howden, Dinuba, Calif., and illustrated by Virginia Cleveland. In addition to the book, the author has prepared a story record and an audio-visual flash pack. Mrs. Howden is instructor in charge of the Elementary Auditory Training Class at Orosi, Calif.

Ever try a Telephone like this?



This is a special telephone for the hard-of-hearing. . . . It has a built-in amplifier controlled by the little button you see here. You can set it for low, medium or high so that the telephone voices can be easily heard.

Would you like to try one of these special telephones? The nearest Business Office of your Bell Telephone Company will be glad to arrange it for you.



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